

Canal preparation procedure

Endo WC-E 2023-2024

D. de Groot - Like

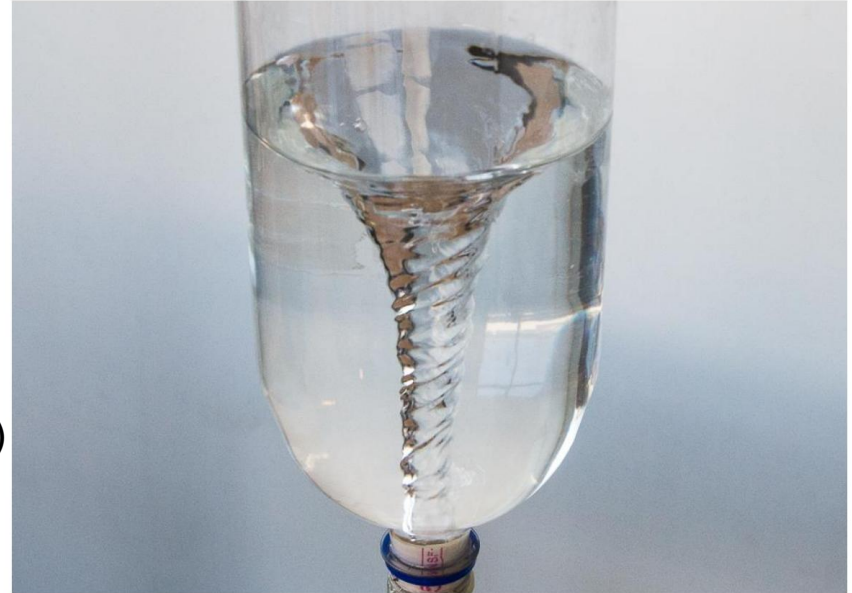
Radboudumc

Canal preparation

- Why?
 - Make root canals accessible in a safe way
removal of irreversibly inflamed pulp tissue and/or infected necrotic pulp tissue.
 - This makes disinfection of the root canal system possible.
 - Creating a “tapered” channel shape that allows good filling.

Canal preparation

- Final canal preparation is “tapered”
- Taper
 - The largest diameter is at the canal entrance and the smallest diameter is at the end of the preparation (near the apex)



Endodontic treatment

- Diagnosis •

Preconditions: caries-free/good restoration/DETI •

Endodontic opening •

Rubber dam

- Coronal phase

- Final length determination on phantom •

Preparation: Step-down/crown-down/apical phase/step-back • Canal

filling • Final coronal closure •

Control

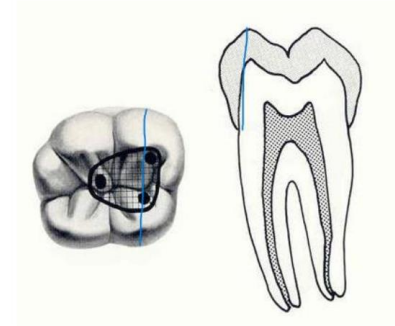
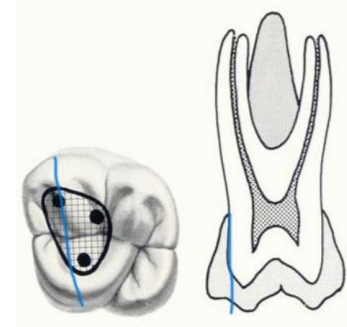
Endodontic opening

- The location of the opening must be chosen in such a way that the “roof” of the pulp chamber can be completely removed: overview of the canals.
- Access to the canals: Endodontic instruments can be inserted into the canal without tension. (not at the expense of aesthetics & strength)
- The element must be easy to restore and disinfect.
- No more dental tissue should be sacrificed than strictly necessary

is

Endodontic opening

- Upper molar
 - Too far to mesial • Triangle
 - Lower molar
- Too far to mesial • Remove distal pulp roof • Distal insertion direction too straight



Cofferdam

- After the opening of the rubber dam
 - Why only after the opening?
 - Overview
 - Inclination
 - Rotation
 - Drilling direction
- When before rubber dam?
 - When you can't find the channels



Cofferdam

- Clean the work area with a cotton pad and alcohol.
- Rinse out the opening with NaOCl. • Only then enter the channels

Natriumhypochloriet NaOCl 2,5%, pH = 12
12cc spuit
20mm lange 27 gauge naald = ISO 35-40
2cc per keer



To rinse

Effect is determined by: •

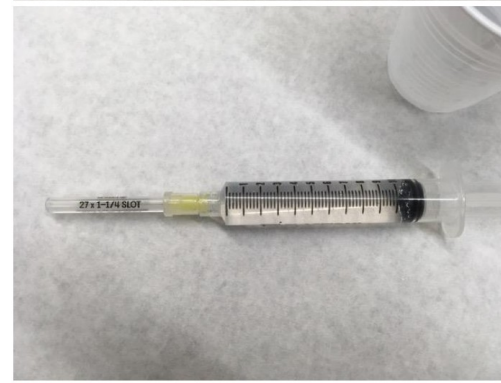
Temperature •

Concentration •

Exposure time •

Rate of renewal





Preparation

- Hand instruments • Rotary

instruments

- Goal

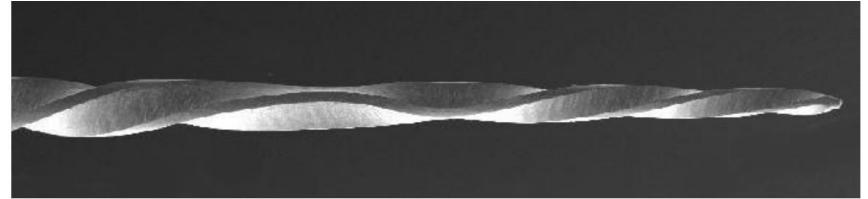
- Make the root canal accessible in a safe manner. • This creates sufficient space for cleaning and disinfection of the root canal system
- Creating a tapered space. • This allows a root canal filling to be applied
root canal (system) closes as well as possible

Handinstrumentarium

- K file (Kerr file)



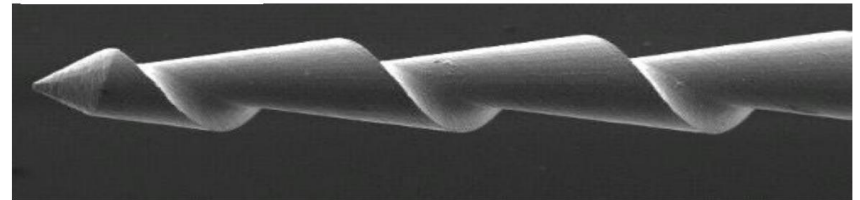
winding K-vijl



- H-file (Hedström file)



winding H-vijl



Handinstrumentarium



Handinstrumentarium

- Number is determined by the thickness in hundredths of mm at 1mm from the end of the file. • So
 - File 6 is 0.06 mm at 1mm from the point
 - File 15 is 0.15 mm at 1mm from the point
 - File 35 is 0.35 mm at 1mm from the point

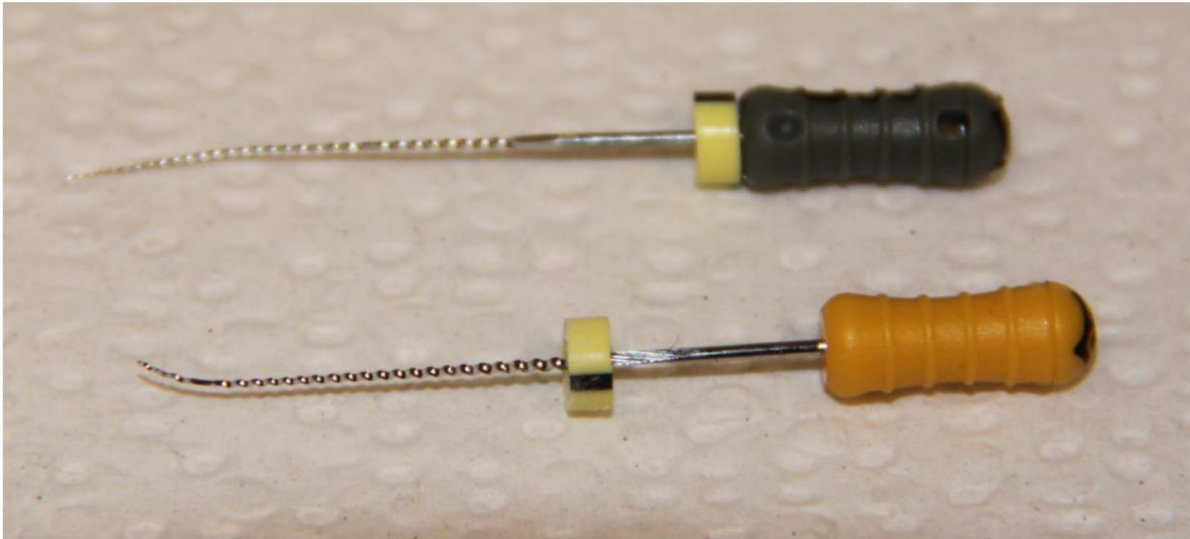


Handinstrumentarium

- Length of active part 16mm
- Lengths 21, 25, 28 and 31



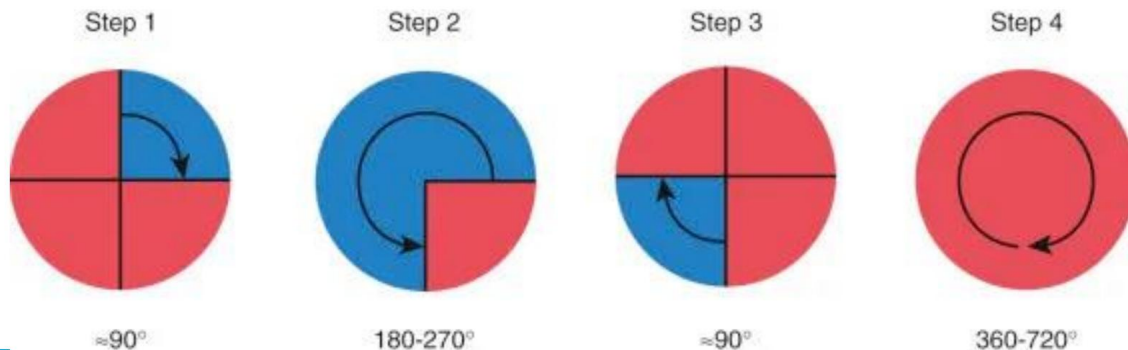
Check the instruments before use



Handinstrumentarium

- Hand preparation / Balanced force
 - Place the file in the canal, turn a quarter of a turn clockwise
 - Then turn three-quarters of a turn counterclockwise, keeping the file in place
 - Turn clockwise and remove the file •

Maximum 3x, if there is a lot of pressure, remove and rinse earlier !

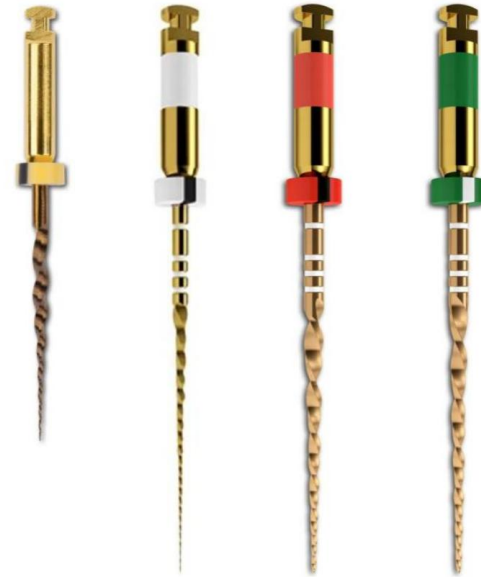


Handinstrumentarium

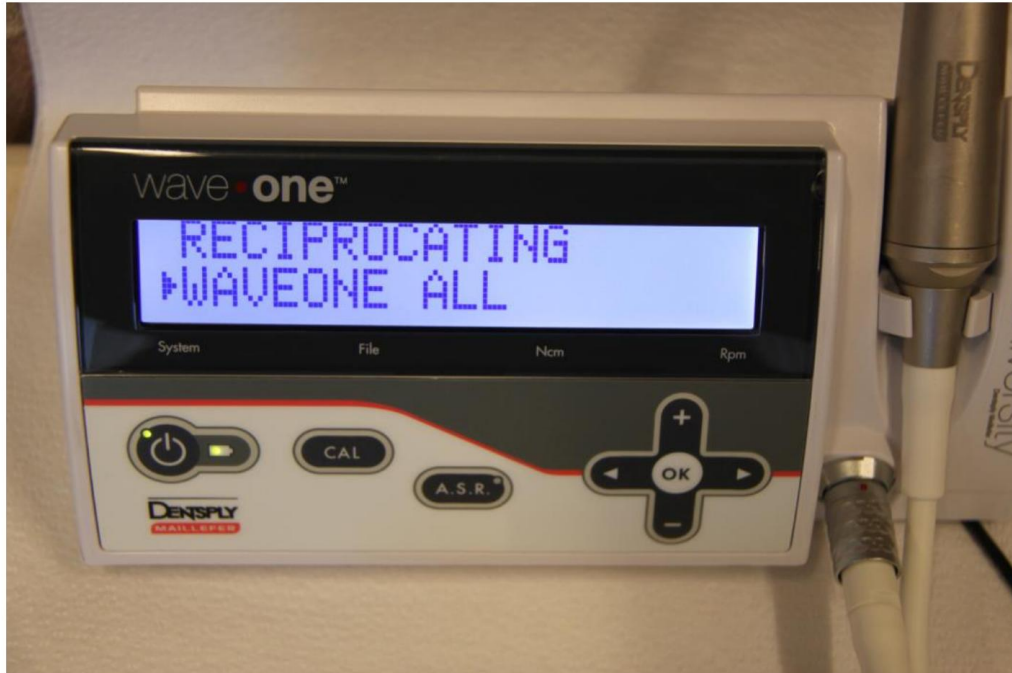
- Video on Brightspace
- Balanced force technique - YouTube

Rotating instruments

- Protaper SX
 - GoldGlider 15/.02 •
 - WaveOne Gold 25/.07 •
 - WaveOne Gold 35/.06
-
- Rotary •
 - Reciprocating •
 - Set to Endomotor



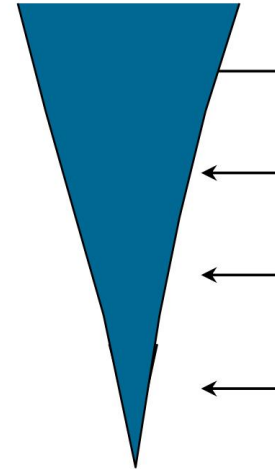
Wave One Motor



Rotating instruments

- Protaper SX
- Goldglider 15.02
- Red 25/07 •
- Green 35/06

- Number before / = apical file diameter at 1mm from the tip
- Number after / = taper, here: taper 07 = conicity of 7%



In summary

- Initial photo available
- Accessibility with #10 •

Coronal curvature removal ProTaper SX • Length
determination • In

clinic with electronic length meter • In
preclinic with X-ray

- Slide with #10 and GoldGlider •

Length photo with minimum #15 (phantom #20)

- TO RINSE!!

Starting photo

- Initial photo of course already taken at diagnosis.
- No endostart without initial photo
- Initial photo
 - Visibility of pulp chamber
 - Visibility of canals
 - Root curvatures
 - Inclinations
- Resorpties



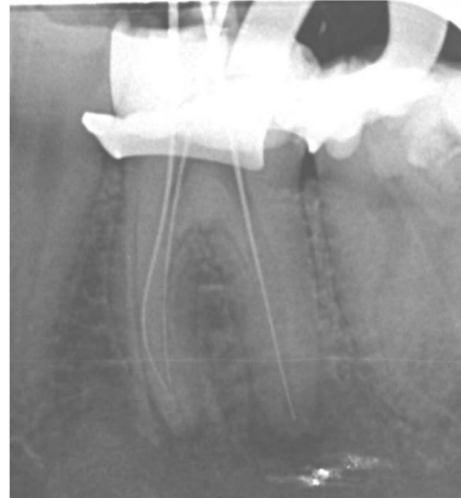
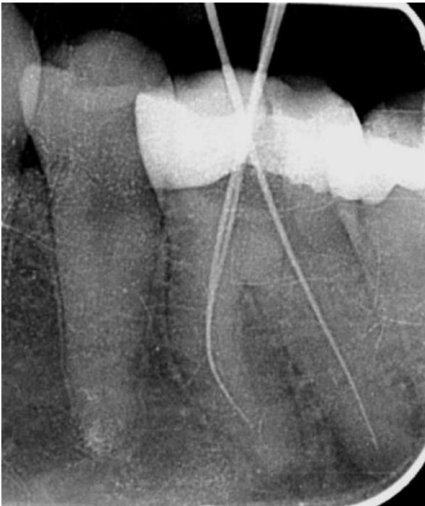
Accessibility

- #10 in channel to verify accessibility of the channel • #10 does not fit -> call in teacher

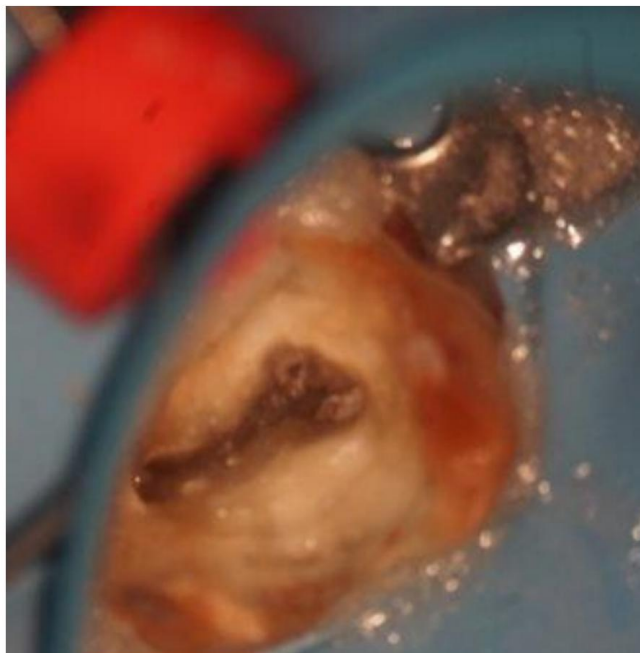
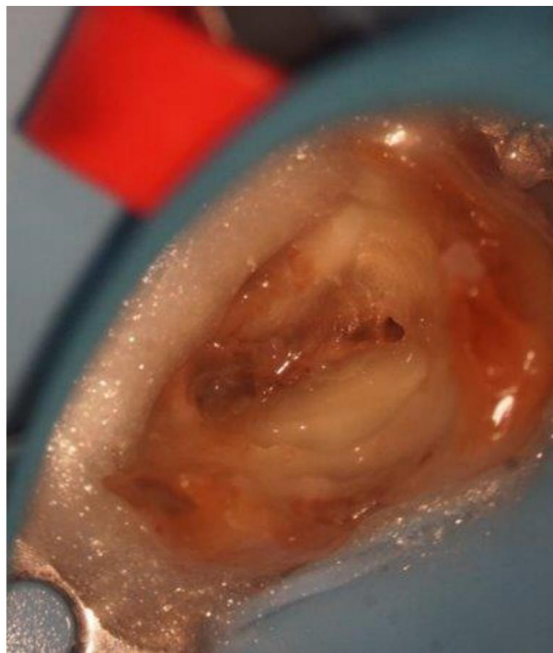


Coronal phase

- Protaper SX
 - Define canal entrance and extract coronal curvature



Coronal phase



Length

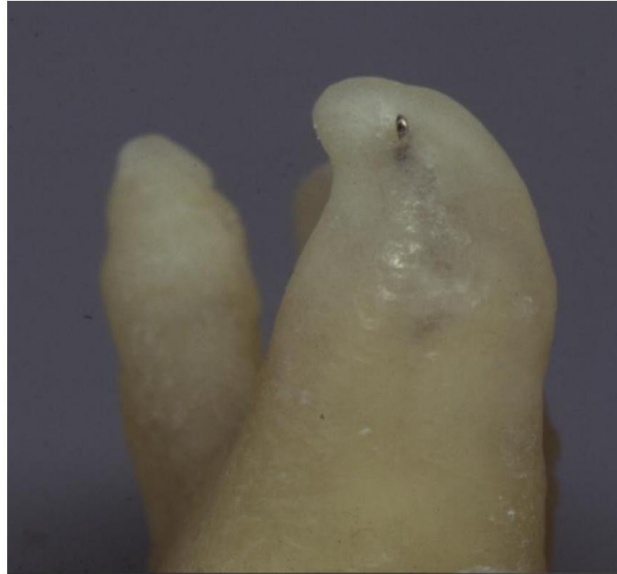
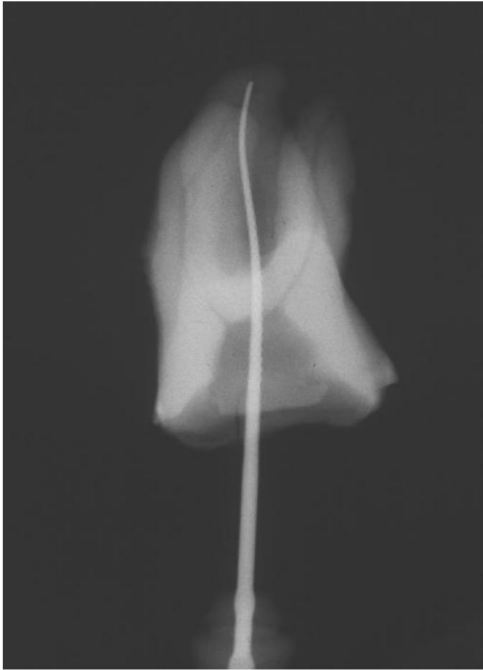
- Length determination Clinic
- Electronic length meter
 - Final length is -1mm
- Length determination Preclinic
- X-ray
 - Measure distance from apex to reference point (lump tip) on initial photo -1mm

Length

- Why is it different at the pre-clinic
 - EAL (electronic apex locator) works not
- Why -1mm
 - Apical constriction
- Please note: measuring on an X-ray may cause distortion of the image.
 - Photo taken straight



Determine length with a photo?



Determine length with a photo?

- Apical foramen falls in more than 60% of cases do not coincide with the apex
- This distance can vary between 0-3mm
- That is why electronic length gauge is decisive.



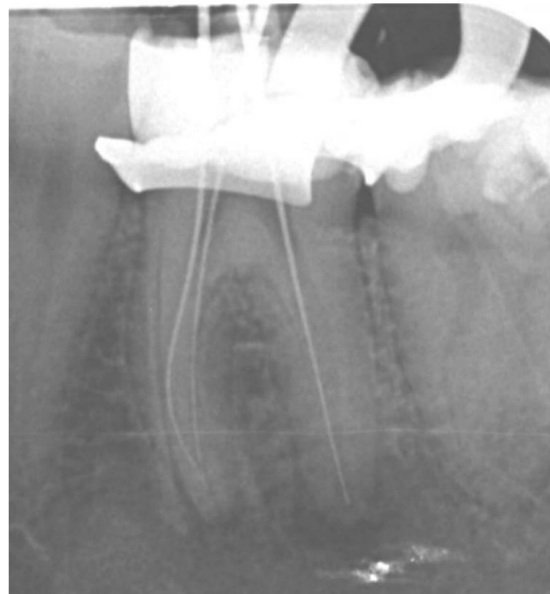
Glide path

- Create a glide path with #10 to the measured length -1mm
- Goldglider to the same length
- Why
 - Anatomical path for files •
 - Less chance of file breakage
 - Easier to work



Length photo

- Longitudinal photo • Minimum #15 • Clip-on • Buccal K-file • Lingual/palatal H-file
- Inserted at a mesial angle • Note a clear reference point
 - Mesio Buccal knob (mbkn) •
 - Palatal knob (pkn) •
 - Mesial randlijst (mrnd)







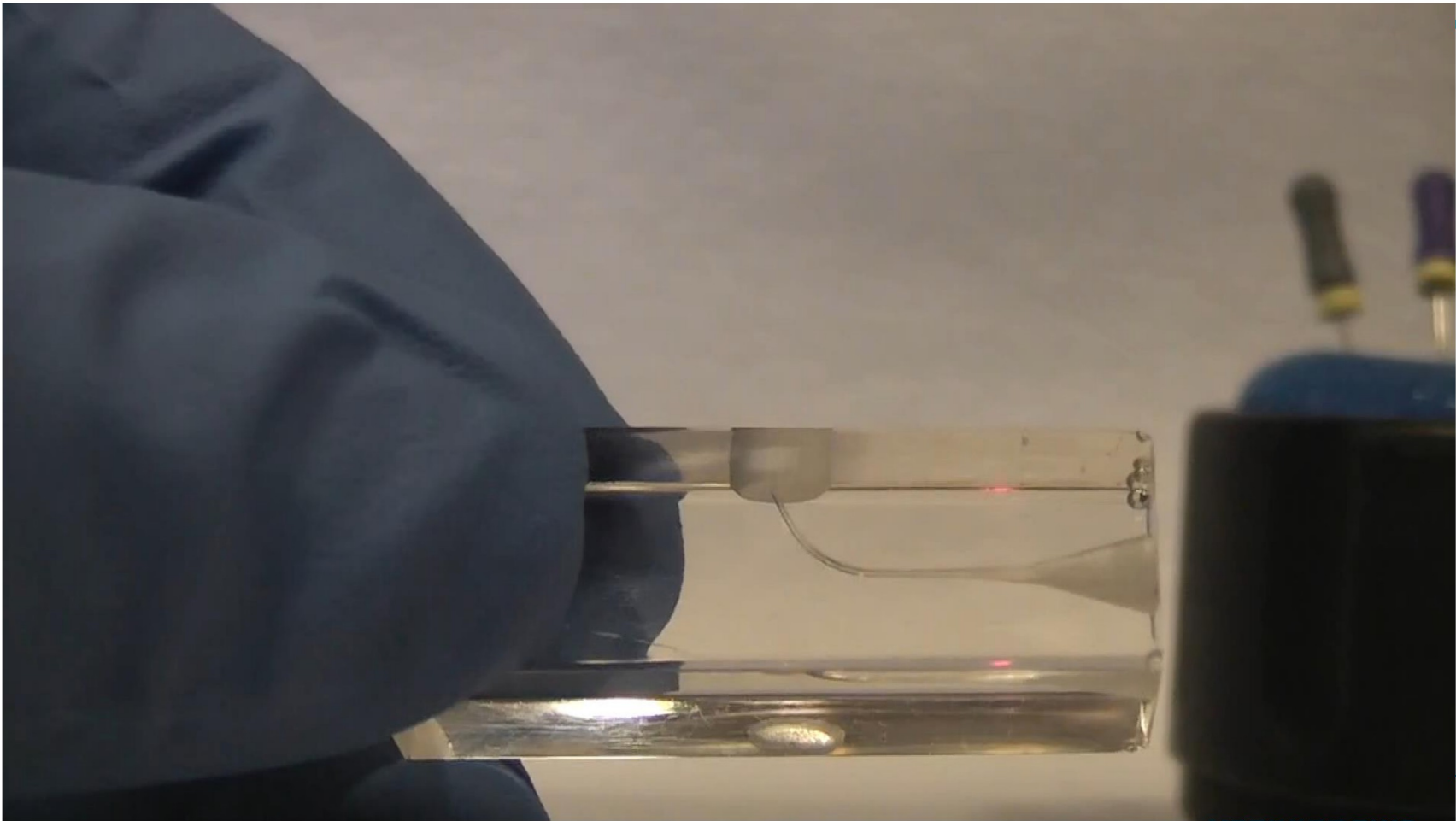
Apical phase

- WaveOne Gold 25/.07
- WaveOne Gold 35/.06
- 3x pecking motion •
- File must go deeper each time •
- Recapitulate •
- Rinse
- First WaveOne 25 to full length. • Then WaveOne 35



Apical phase

- Preparation at working length (up to the apical constriction)
- Prepare on the plastic block with hand files up to and including hand file 35



Help with hand preparation

- Hand preparation Perspex:
- Approximate working length
- Glide path, Protaper SX
- Step-down/apical phase: #10 to #35 (hand file)
- (Step-back: #35/#40/#45/#50/#60 steps of 1mm back)