Dental Simulation
(Rotary Preparation)

Practical Endodontics – Working as a Team
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We are wanting to create a continuous tapered shape allows early flow of sodium hypochlorite to apex and makes obturation more effective

- Smooth continuous taper from apex to crown
- Voidless condensation of root-filling
- Root filling finishing within the apical 2mm or flush to the apex
- Good coronal seal
Break Canal Preparation
four areas:

• Coronal access
• Top third
• Mid third
• Apical third
Coronal Third Choice for Orifice/lip shaping

SX

G4  G3  G2

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Protaper Shapers:

SX

S1

S2

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SX equivalent to GG 1-4 in One instrument
SX good for opening things up
SX good for open up MB2s
Get the top bit right and you will reduce the risk of future canal transportation.
Getting the best out of conventional Hand K filing – Watch-Winders

1. Thread the file down the root canal with a gentle clockwise rotation – no more than a quarter / half turn
2. On apical resistance, keep apical pressure on and de-rotate the file to the same degree as it moves coronally
3. Keep repeating the process until the file is loose at the required length.
4. Then move up a size
Watch-winders movement – confirm length, get apical patency and create guide path
Apical Third of Canal
Gauging & Diagnostic radiographs in a digital age

• Learn to use and trust an EAL – it’s right as long you can get predictable Zero readings and it’s not ‘jumping / zipping’

• Prepare the root canals with tip of EAL placed on the hand piece as you work
Correct access and radicular preparation will allow passive placement of scout file and the early taking of the W/L.
Coronal third of root canal
(ProTaper S1 Purple)
Why I like ProTaper & Profiles?

- ‘Brushing action’ (ProTaper) allows straight line access to be established quickly
- **ProTaper** offers variable taper – working on one bit of the canal at a time
- **ProTaper** alone can establish basic shape in a straight/minimally curved canal with 3 instruments
- **Protaper** excellent for coronal 2/3rds of canals
- **Profile** less aggressive and less tapered at apex – therefore more suitable for apical finishing
- **ProFile** offers continuous fixed taper and is less aggressive in the apical third compared to the **Protaper** finishing files
Coronal Shape S1 & Mid (deep) Shape S2

Canal shaping

S1

S2

Practical information & knowledge
Apical Third / Apical Preparation
Apical third - Protaper options - Canal finishing – I am happy for you all to get F1 (red) to length and then stop.
Overall canal shape at this point (F1 to length)

- Coronal flare
- Continuous taper
- No deviation/transportation from the original canal shape
- No ledging or zipping
- Apical stop 0.5-2mm from anatomical apex
Summary of ProTaper Preparation
(for straightforward canals)
• Access / GGs / SX
• Small scout #08/#10 K files passed to the apex of the canal(s) with aid of watch winders (patency) - WL estimation with EAL / or X-ray with at least a size #15 file in situ

• Protaper S1 (purple) or S2 (white) to full working length
• Protaper F1 (yellow) to full length

• Gauge apex with hand K file after F1 use to apex
• Then use an appropriate sized ProTaper F2 or F3 depending on apical gauge
• Pre-cementation radiograph with verified Profit GP point(s) in situ
• Dynamic pumping

• Obturation
Apex / Apical Third Preparation – straightforward anatomy

- Gauge apex with hand K file after ProTaper F1 use to working length
- Then use ProTaper F2 if gauges at #25 or F3 if #30
- If apical gauge is #20 work with the F1
Early apical gauge

- After use of Protaper S1, S2 & SXs use a suitable sized K file to find out which size fits at the ideal WL
- Gentle index finger push vertical pressure – no twisting / rotation
- Usual size to start: buccals of upper molars and mesials of lower molars start with #20
- Pals and Distals: #30. Single rooted teeth #35
Late apical gauge

• After use of Protaper or Profile finishing files use a suitably sized K file to confirm the size of your finished apex – file should bind tightly at apical length and not shoot through apex

• Remember for gauging hand file - gentle index finger push vertical pressure – no twisting or rotation
Apex / Apical Third preparation – complex anatomy

• Manual apical gauge apex with hand K file after ProTaper SX/ S1/S2 to working length
• This verifies apical size
• Then use #20, #25 or #30 Profile 04 /06 dependent on apical
Preparation for Obturation
What do we need to do prior to Obturation?

- Confirm the apical gauge of your completed canal(s)
- This involves using a hand K file passively (without any rotation) and working out what apical size fits tightly at the apical stop
- Will best ‘match’ the apical fit of the point to optimise future seal and reduce the risk of creating overfill
Verification of GP point to gauge plastic Maillefer ruler
Indirect Gauging of GP Point

Verify the apical size of your chosen gauge with a plastic Maillefer ruler – GP points vary massively – cut level with scalpel blade and you have a point gauged for your canal.
Direct Gauging of final GP point

• Try-in point corresponding to final apical master file

• Measure the length of the seated point. Too short – go to a smaller point and direct gauge

• If too long then ‘snip’ off excess length, re-seat and re-gauge until point solid at chosen length
Direct Gauging of final GP point
Master GP point try-in and radiograph

• Seat GP point within the root canal and check length of seat matches with your chosen reference point
• In multi-rooted teeth consider cutting off the points level with the chosen reference points
• Posteriorly, I am happy to take off the rubber dam off quickly to record the LCPA radiograph – then straight back on with the RD
GP try-in – digital sensor -
Remember that accurate apical Gauging is only possible because you have removed other factors that may have complicated the process from higher up the canal in your coronal and mid canal preparation.
Summary of Hybrid Preparation
(for difficult canals)

- Access / GGs / SX
- Ensure that a small scout #08/#10 K files can be passed to the apex of the canal(s) – WL estimation with EAL / or X-ray with at least a size #15 file in situ
- **Protaper** S1 (purple) or S2 (white) to full working length
- **Protaper** F1 (yellow) to full length
- Gauge apex with hand K file
- Use appropriate sized double-striped **Profile** (06 taper) to apex
- Pre-cementation radiograph with verified GP point(s) in situ
- Dynamic pumping – followed by Obturation

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