

FAQ – BioRaCe

Controlling intracanal infection with mechanical instrumentation

Mechanical instrumentation is a critical step in the prevention/disinfection of the root canal. Studies have shown that even when no biologically active irrigating solution is used that as the canal is instrumented to larger diameters so the number of remaining microbes is significantly reduced. However, a dilemma exists in that the natural sizes of the apical third of almost all root canals are surprisingly large. Studies have been performed as to how large a canal should be instrumented in order to adequately clean (and thus disinfect) most root canals. The anatomical chart (look at: <http://www.biorace.ch/download/FKG-BioRace-charte-anatomiq.gif>) is what is recommended as minimal sizes in order to have the best chance of cleaning the root canal. References below:

Reference articles on biological sizes

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3. Bartha T, Kalwitzki M, Löst C, Weiger R. Extended apical enlargement with hand files versus rotary NiTi files. Part II. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2006; 692-7.
4. Weiger R, Bartha T, Kalwitzki M, Löst C. A clinical method to determine the optimal apical preparation size. Part I. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2006:686- 91.
5. Green D. A stereo-binocular microscopic study of the root apices and surrounding areas of 100 mandibular molars. A Preliminary study. Oral Surg Oral Med Oral Pathol 1955; 8:1298-1304.
6. Green D. A stereomicroscopic study of the root apices of 400 maxillary and mandibular anterior teeth. Oral Surg Oral Med Oral Pathol 1956; 9(II):1224-31.
7. Kuttler Y. Microscopic investigation of root apices. JADA 1955; 50:544-52.
8. Wu M, R'oris A, Barkis D, Wesselink PR. Prevalence and extent of long oval canals in the apical third. Oral Surg Oral Med Oral Pathol 2000; 89:739-43.
9. Card SJ, Sigurdsson A, Orstavik D, Trope M. The effectiveness of increased apical enlargement in reducing intracanal bacteria. J Endod. 2002:779-83
10. Baugh D, Wallance J. The role of apical instrumentation in root canal treatment: A review of the literature. J Endod 2007;31:333-340.
11. Shuping G, Ørstavik D, Sigurdsson A, Trope M. Reduction of intracanal bacteria using Nickel-titanium rotary instrumentation and various medications. J Endodon 2000 26:751-5.
12. McGurkin-Smith R, Trope M, Caplan D, Sigurdsson A Reduction of intracanal bacteria using GT rotary instrumentation, 5.25% NaOCl, EDTA, and Ca(OH)₂. J Endod. 2005:359-63.

Why choose BioRaCe?

Until the BioRace sequence was introduced, the practitioner had to choose between a step-back apical preparation (inferior cleaning and relying on irrigation) or the other alternative which is to use two sets of files, the first set is to reach the apical third with decreasing tapered instruments (crown-down fashion) and then a second set of files with a lesser taper in order to adequately clean the critical apical third of the canal (apical enlargement). Research has shown that the use of two sets of files with a hybrid technique is superior to the step-back alternative and in fact can in many cases with adequate adjuncts consistently render the canals culture negative (9). However, since a second set of files is required adding additional time and expense to the procedure, most manufacturers promote step-back canal shapes since fewer instruments are required and thus they are more attractive to the dentist who is also used to preparing canals to this shape. The BioRace sequence uses our knowledge of the natural sizes of canals in order to minimize the number of files (one set of files) required to both adequately crown-down and enlarge apically without undue stress of each file. **The major goal of BioRaCe sequence is to PREPARE the CANALS TO BIOLOGIC SIZES WITH ONLY A SMALL NUMBER OF FILES!!!!!!**

What is the difference between RaCe and BioRaCe?

BioRaCe instruments possess the same physical characteristics of the well known NiTi rotary RaCe instruments with, a) alternating cutting edges, b) non-cutting safety tips, c) sharp cutting edges

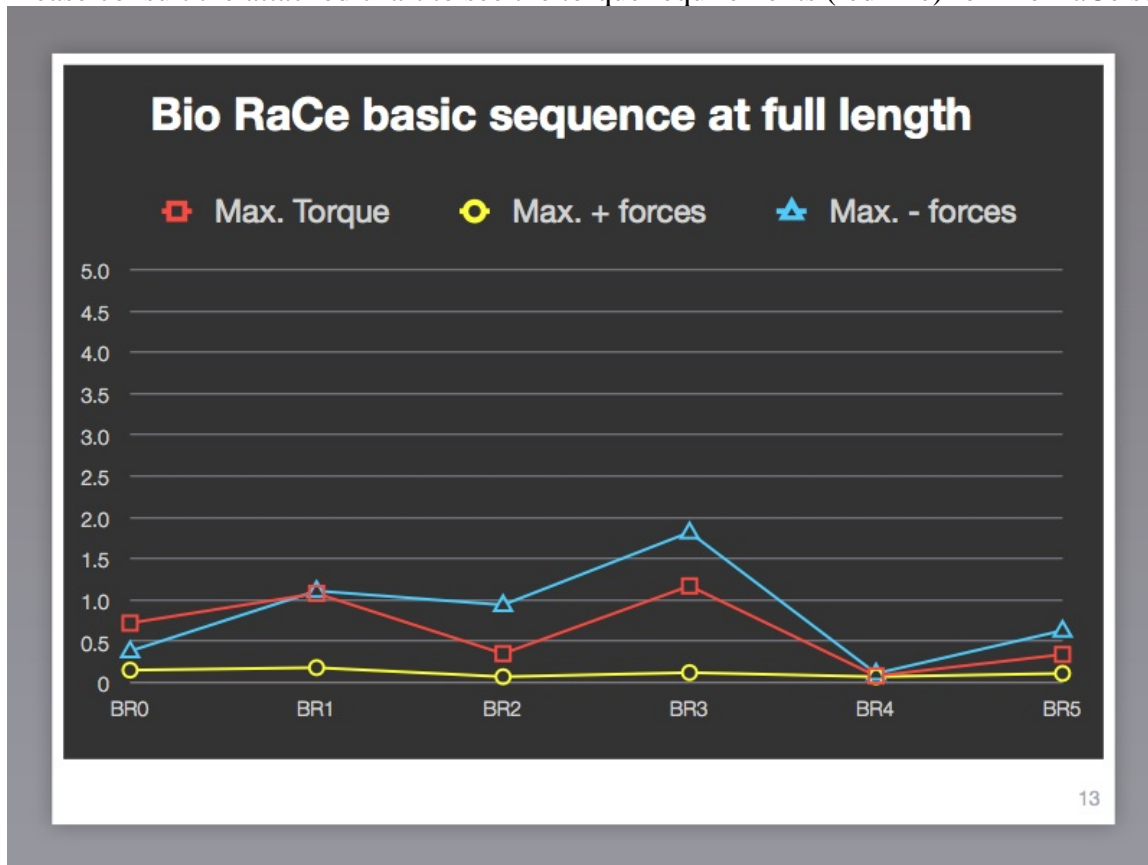
(triangular section) without radial lands, and d) electro-chemical surface treatment. Bio RaCe differs from standard RaCe instruments in regard to instruments tapers, sizes, sequence and handle codes. (<http://www.biorace.ch/pagesweb/BaSequ.aspx> and <http://www.biorace.ch/pagesweb/ExtSequ.aspx>)

What is the recommended speed for BioRaCe?

Because its low torque requirements, Bio RaCe can be used between 500 to 600 rpm.

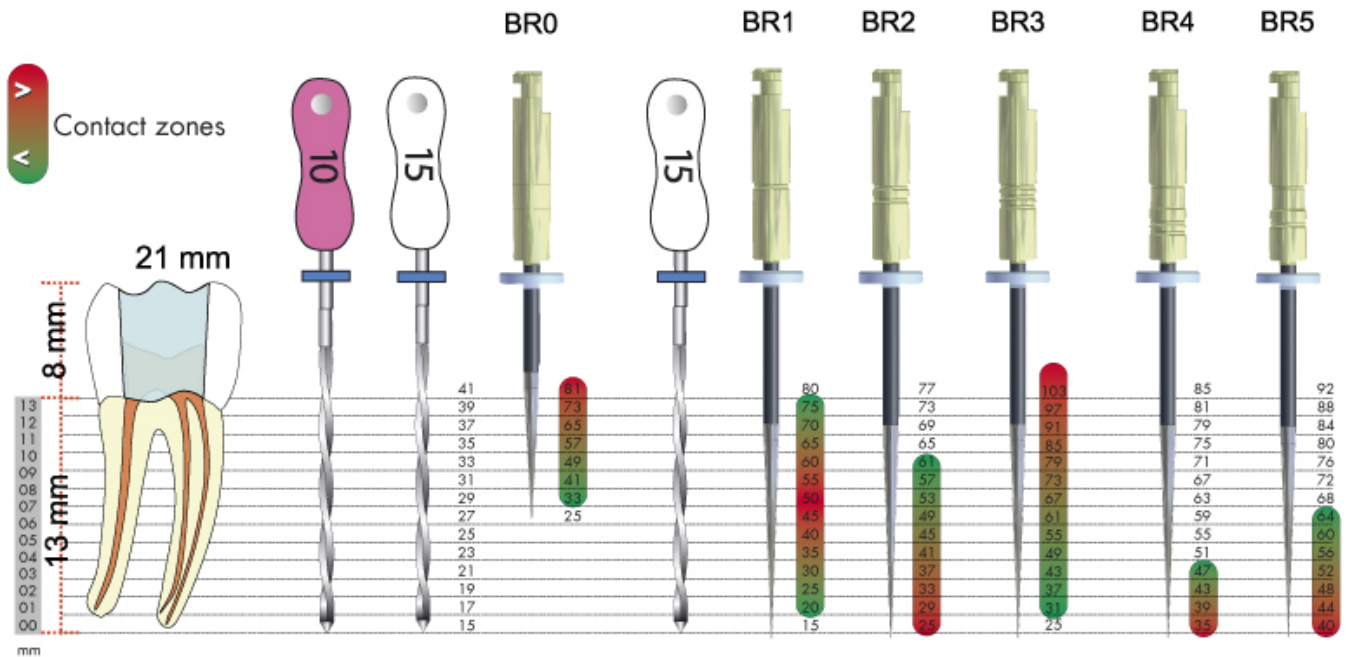
It is necessary to use a special endodontic motor?

No, but the motor must provide a low constant speed (500-600 rpm) with a low torque (0.5-1.5 Ncm). Please consult the attached chart to see the torque requirements (red line) for Bio RaCe sequence.



Is BioRaCe used in Crown-down fashion?

No. With the exception of BR0 (25/0.08/19mm) all BR instruments should be taken (if possible) to full working length. Please consult the chart showing the contact zones of this instruments on the dentinal wall. Note that 3 of the 6 instruments on the basic set have the tip of the instrument working freely (BR0, BR1, BR3) at full working length.



Why doesn't BioRaCe thread in?

Because like RaCe instruments, BioRaCe is made up of alternating (straight and twisted) flute sections; this unique design prevents threading in.

Does threading increase the risk of file separation (breakage)?

Yes, because self-threading blades tend to bind, and once they bind, they may break without warning. In other words: self threading \Rightarrow increases working torque \Rightarrow increases torsion fatigue \Rightarrow breakage.

A few competitors tend to eliminate 0.02 taper instruments – why?

Because they have never solved the threading-in problem with their flute design (self-threading). Also a number of obturation systems require a final preparation with at least a taper of 0.04. If curved canals, 0.02 taper BioRaCe instruments (extended set) are far more flexible than any competitor instrument at the same size (because its triangular cross section) which would be ideal to reach biological sizes even in curved canals (#35 or 40).