

Purpose: The purpose of this column is to highlight important research, advancements, and clinical guidelines in dentistry, published in the top impact dental & medical journals in 2025.

1. Clear Aligners (CA) – factors that are crucial to clinical success

- **Field:** Orthodontics
- **Methodology:** Review and Expert Consensus
- **Clinical and practical significance:**

Novel materials and artificial intelligence leading to less difficulty in complex malocclusion cases treatment with this clear aligner technology, allowing more patients access to improved comfort, convenience, efficient, and better treatment outcomes.

- **Focus areas and Recommendations / Clinical**

Guidelines:

Case selection: “CA can be used to treat nearly all types of malocclusions- especially patients with high esthetic demands, comfort requirements, poor periodontal conditions and susceptibility to caries.”

Treatment difficulty: “CA are not recommended for patients with clinically short crowns, requiring extensive mesial movement of posterior teeth, or showing poor compliance.”

Principles:

-Crown surface and fitness of aligners are the key points to success.

-Attachments bonded on the crowns increases the surface area and afford more action points of the force and biomechanical demands.

-Individual teeth or groups of teeth movements are designed a stepwise mode.

- “Aligners are regularly replaced, helping teeth to move gradually to the desired position under the effect of a continuous gentle force.”

- A critical aspect of tooth repositioning in three dimensions is the acquisition and redistribution of space.

- “Five methods of gaining space are: arch expansion, molar distalization, incisor proclination, interproximal reduction, and extraction.”

Clinical procedures: Diagnosis; Difficulty assessment; Digital model; Treatment planning; Aligner fabrication; Fitting initial set of aligners; Follow-up monitoring of fitting, attachments and movement; Treatment outcome; and Retention.

Challenges: Expansion and molar distalization, intrusion, extrusion and torque control are more complex movements which have much lower predictability

Complications: Poor oral hygiene during CAT can cause dysbiosis leading to white spot lesion and caries. CAT may lead to root resorption.

Relapse – The use of retainers and correction of oral habits (i.e., tongue thrust swallowing) are effective measures for reducing relapse risk.

- **Reference:** Wang Y, Long H, Zhao Z, et al. Expert consensus on the clinical strategies for orthodontic treatment with clear aligners. *Int J Oral Sci* 2025; 17, 19. <https://doi.org/10.1038/s41368-025-00350-2>

2. Restoration of endodontically treated molar teeth

- **Field:** Restorative dentistry
- **Methodology:** A three-year randomized clinical trial
- **Clinical and practical significance:**
 - “No significant difference in 3-year survival/success rates between crowns and direct composite restorations in restoring endodontically treated teeth with minimal structural loss.”
 - “Crowns showed better durability; direct restorations performed worse over time.”
 - “Direct composite restorations may be a suitable alternative in cases with reduced occlusal loads, a need for endodontic monitoring, or financial reasons.”
 - “Bruxism increases failure risk: indirect monolithic zirconia may be better for patients with bruxism.”
- **Reference:** Abu-Awwad M, Halasa R, Haikal L, et al. Direct restorations versus full crowns in endodontically treated molar teeth: A three-year randomized clinical trial, *Journal of Dentistry*, 2025; 156. <https://doi.org/10.1016/j.jdent.2025.105699>.

3. Drug interruption and risk management guidelines for patients with osteoporosis receiving anti-resorptive therapy (ART), who require dento-alveolar surgery

- **Field:** Oral surgery / Dental implantology
- **Methodology:** Review and Clinical Guidelines
- **Clinical and practical significance:** Osteoporosis patients undergoing ART who require dento-alveolar surgery (i.e., dental extractions & implants), are at risk of medication-related osteonecrosis of the jaw (MRONJ).
 - “Dental practitioners should always inform patients of the risk of MRONJ before invasive dental procedures and provide alternative treatment options when feasible.”
- **Clinical guidelines:**
 - Minimizing elective dento-alveolar surgery is recommended where clinically feasible but should not be considered an absolute contraindication.
 - Regular dental examinations (every 6 months), early treatment of oral problems, and maintenance of optimal oral hygiene reduce the incidence of MRONJ.
 - **For ART medication-related risk assessment: (See Ref)**
 - **Recommended discontinuation intervals** - Collaborate with physician: **(See Ref)**
 - **For extraction and implant surgical protocol recommendations: (See Ref)**
 - “Adherence to these guidelines does not ensure complete prevention of MRONJ, however, it serves to minimize its risk.”
- **Reference:** Wei L-Y, Chiu C-H, Kok S-H, et al. Risk assessment and drug interruption guidelines for dentoalveolar surgery in patients with osteoporosis receiving anti-resorptive therapy, *J of Dent Sci* 2025; 20(2): 729-740. <https://doi.org/10.1016/j.jds.2025.02.002>.

¹ Johan Hartshorne, B.Sc., B.Ch.D., M.Ch.D., M.P.A., Ph.D. (Stell), FFPH.RCP (UK) General Dental Practitioner Intercare Medical and Dental Centre, Tyger Valley, Bellville, South Africa, 7530. Email: johan.laptop@intercare.co.za

¹ Hugo Johan Kotzé, BDS (UWC) General Dental Practitioner Intercare Medical and Dental Centre, Tyger Valley, Bellville, South Africa, 7530. Email: hugokotze17@gmail.com

