Compiled by Johan Hartshorne[1] and Hugo Johan Kotzé[2]

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. Consensus standard of care for temporo-mandibular disorders (TMD)

Field: Oral Medicine Multidisciplinary

Methodology: International Expert Consensus Statement

Clinical and practical significance:

- The INfORM group of the IADR has developed the first global consensus on the standard of care for TMD management.
- The consensus was finalized at the IADR General Session in New Orleans (March 2024) and outlines 10 key principles for evidence-based TMD diagnosis and treatment.
- It marks a shift from a mechanical, occlusal-based view to a medical and biopsychosocial model, promoting conservative and multidisciplinary care over irreversible or surgical interventions.

Key findings:

- Patient-centred care and shared decision-making are essential, focusing on symptom control and quality of life.
- TMD comprises musculoskeletal conditions causing orofacial pain and dysfunction.
- The aetiology is biopsychosocial and multifactorial.
- Diagnosis is based on validated clinical assessment and patient history by a trained clinician.
- Imaging (MRI/CBCT) is used selectively when it influences diagnosis or treatment.
- Interventions and devices must be evidence-based; current chairside technologies lack support.
- Treatment aims to reduce pain, improve function, and educate patients on managing flare-ups.
- First-line therapy: self-management, physiotherapy, and cognitive-behavioural strategies.
- Oral appliances serve as short-term aids; irreversible or occlusal treatments are generally not indicated.
- Complex or chronic cases should be referred to trained orofacial pain specialists.

Reference: Manfredini D, Kandasamy S. Temporomandibular disorders: Do we finally have a consensus standard of care for dissemination? American Journal of Orthodontics and Dentofacial Orthopedics. 2025. Available from: https://www.sciencedirect.com/science/article/pii/S088954062500383X

2. Clear aligner orthodontic treatment: international modified Delphi consensus study

Field: Orthodontics

Methodology: International Modified Delphi Consensus Study

Clinical and practical significance:

- This international Delphi study aimed to define the current clinical potential and limitations of clear aligner therapy (CAT) by combining expert consensus with evidence from recent literature.
- Thirty-six orthodontic specialists participated in three Delphi rounds, resulting in 47 consensus statements on both biomechanical and extra-clinical aspects of aligner treatment.
- The findings highlight what aligners can predictably achieve and where their limitations remain, offering clinicians practical guidance for case selection, movement staging, and treatment planning.

Key findings

The Delphi consensus produced 47 statements summarizing the biomechanical potential and limitations of clear aligner therapy (CAT):

- Tipping: Aligners achieve tipping movements with high predictability, particularly uncontrolled buccolingual or palatal crown inclination, due to simple single-force biomechanics.
- Rotation: Rotations <10–20° are moderately predictable; accuracy decreases with larger or round teeth, requiring attachments or overcorrection.
- Distalisation: Moving distally up to 2–2.5 mm is reliable, but larger movements decrease accuracy and require careful staging and anchorage control.
- Mesialization: Less predictable than distalization; bodily movement and torque control need auxiliaries to prevent anchorage loss.
- Extrusion and Intrusion: Vertical movements are unpredictable beyond 1.5 mm. Extrusions need rectangular attachments or elastics; intrusions are limited to minor anterior corrections.
- Bodily movement and root torque: Among the least predictable movements, controlled staging, overcorrection, and auxiliaries are essential.
- Expansion: Aligners permit dentoalveolar expansion only; skeletal expansion requires hybrid or fixed appliances.
- Extraction and space closure: Single-tooth extraction cases are feasible, but four-premolar or large-space closures demand hybrid mechanics and precise anchorage.
- Mixed dentition: Effective for dental corrections in children (8–13 years), not for skeletal or orthopaedic changes.
- Retention: Lifelong retention advised—fixed in the mandible, removable in the maxilla—to maintain stability.

Reference: Arveda N, Calza M, Castroflorio T, Garino F, Giancotti A, Varela JC, et al. Clear aligner orthodontic treatment: An international modified Delphi consensus study. Am J Orthod Dentofacial Orthop. 2025 Nov;168(5):620–638. doi: 10.1016/j.ajodo.2025.07.012. Available from:https://www.sciencedirect.com/science/article/pii/S0889540625003336

3. Adverse events in nonsurgical facial aesthetic procedures – systematic review and meta-analysis

Field: Aesthetic Dentistry / Facial Aesthetics

Methodology: Systematic Review and Meta-analysis

Clinical and practical significance:

- This systematic review analysed 77 studies involving over 25,000 patients who underwent nonsurgical facial aesthetic procedures (NSFAPs) such as botulinum toxin injections, dermal fillers, and laser therapies.
- It offers a current overview of the prevalence and clinical profile

[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

Compiled by Johan Hartshorne[1] and Hugo Johan Kotzé[2]

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.

of treatment-related adverse events (TRAE) associated with these procedures.

Key findings:

- The overall pooled prevalence of treatment-related adverse events (TRAEs) was 34.8%, with most being mild and transient.
- Hyaluronic acid (HA) fillers showed the highest complication rate (63.0%, 95% CI: 35–84%), followed by nonsurgical thread lifts (20.0%) and botulinum toxin injections (18.0%).
- HA fillers accounted for 67.3% of all recorded adverse events — predominantly swelling (22.4%), pain (19.0%), and bruising (6–8%).
- For thread lifts, the main complications were pain (31.5%) and bruising (23.4%), while botulinum toxin procedures were most associated with headache and temporary asymmetry.
- The authors noted that most reported TRAEs were mild and self-limiting, while serious or unexpected events were uncommon and often under-reported.
- ***Reference:*** Cruz VMS, Sousa-Neto SS, Pedroso CM, et al. Adverse events in nonsurgical facial aesthetic procedures: A systematic review and meta-analysis. Oral Dis. 2025;1–11. https://doi.org/10.1111/odi.70109.

4. Drugs for procedural sedation and analgesia in children

Field: Pediatric Dentistry / Clinical Pharmacology

Type: Network Meta-Regression of Randomized Clinical Trials

Clinical and practical significance:

This comprehensive meta-analysis provides an updated overview of sedative and analgesic agents used for procedural management in children, including dental procedures. With evidence from nearly 100 randomized controlled trials involving over 9,000 children, the study offers clear guidance on which pharmacologic agents deliver the best balance between sedation success, safety, and practicality in pediatric care.

Key findings

- Dexmedetomidine and the midazolam–ketamine combination emerged as the most effective regimens for achieving reliable sedation and anxiolysis.
- Intranasal dexmedetomidine at 2 µg/kg achieved the highest sedation success, outperforming lower doses and midazolam alone.
- Midazolam combined with ketamine improved sedation quality and reduced the need for additional dosing compared with midazolam monotherapy.
- Chloral hydrate, historically common in pediatric dentistry, showed higher rates of vomiting, prolonged recovery, and potential carcinogenic risk—supporting its gradual removal from current protocols.
- Physiologic effects: Dexmedetomidine lowered blood pressure slightly, while ketamine increased it but shortened the onset time.
- Most studies were conducted in paediatric dentistry and imaging contexts, highlighting its relevance to clinical dental sedation.

Conclusion:

No single agent fully meets the ideal criteria of quick onset, predictable depth, minimal side effects, and easy administration. However, the findings support intranasal dexmedetomidine and midazolam–ketamine combinations as practical first-line options for pediatric sedation, offering safe and effective control with fewer complications.

Reference: Hamdan S, Adelou S, Jungo S, et al. Drugs for procedural sedation and analgesia in children: A systematic review and meta-analysis. Drugs in R&D. 2025;25:179–193. https://doi.org/10.1007/s40268-025-00522-9

5. What role do luting cements play in Zirconia crown survival?

Field: Prosthodontics / Restorative Dentistry

Type: Randomized Clinical Trial Commentary

Clinical and practical significance:

This commentary reviews a two-year randomized split-mouth clinical trial comparing glass ionomer cement (GIC) and resin-modified glass ionomer cement (RMGIC) for the retention of ceramic-fused-to-zirconia crowns. The study provides valuable clinical insight for everyday restorative practice, emphasizing that both cements perform predictably when tooth preparation, resistance form, and occlusal design are correctly executed.

Key findings:

- Over a 24-month follow-up, RMGIC showed 100% retention, while GIC recorded a slightly lower rate of 93.3%.
- Failures were limited to anterior crowns luted with GIC (83.3%), suggesting that resin modification may improve retention where preparation geometry or aesthetics pose greater challenges.
- Posterior crowns performed equally well with both cements, showing no significant difference in success or survival.
- No cases of secondary caries, pulpal inflammation, or crown fracture were reported during the observation period.
- Statistical testing found no significant difference between cements, but this was likely due to the small sample size and limited statistical power.
- The fluoride release of GIC, while often discussed as a benefit, was not shown to influence outcomes in this study.

Conclusion:

- Both GIC and RMGIC remain clinically reliable luting agents for zirconia crowns when sound preparation principles are followed.
- For posterior restorations, conventional GIC offers adequate performance and ease of use.
- However, in anterior regions or where additional retention is required, RMGIC may offer greater predictability without compromising biological compatibility or ease of cement removal.

Reference: Craig R, McKenna G. What role do luting cements play in zirconia crown survival? Evid Based Dent. 2025;26:130–131. https://doi.org/10.1038/s41432-025-01172-1

[2] *Hugo Johan Kotzé, BDS (UWC) General Dental Practitioner*
Intercare Medical and Dental Centre, Tygervalley, Bellville, South Africa, 7530. Email: hugokotze17@gmail.com