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

Purpose: The purpose of the column is to highlight significant research findings, advancements, and clinical guidelines in dentistry, as published in the leading high-impact Dental and Medical Journals in 2026.

1. Long-term stability after non-surgical treatment of periodontitis. A systematic review of randomized clinical trials

Field: Periodontology

Purpose: (i) To evaluate the long-term (>5 years) efficacy of non-surgical periodontal therapy (NSPT); (ii) To explore the of effectiveness of alternative or adjunctive therapies in NSPT.

Key Findings:

- The gold standard for NSPT is subgingival instrumentation together with regular supportive periodontal care.
- Long-term evidence on the use of various alternative and adjunctive therapies is limited.
- The use of laser as an alternative or adjunctive therapy to subgingival instrumentation shows conflictive results.
- Adjunctive use of antimicrobial photodynamic therapy show modest clinical improvement in the short-term (3-6 months).
- Subgingival air-polishing may improve patient comfort and reduce treatment times.
- NSPT together with regular supportive periodontal care is a reliable and long-lasting treatment option.
- Long-term periodontal stability depends not only on initial NSPT, but also on supportive periodontal care (SPC), patient compliance, and risk-factor control.
- Further research is required to better understand the long-term systemic health effects of NSPT.

Clinical Relevance:

- Non-surgical periodontal therapy (NSPT) remains the gold standard for treatment of periodontitis in most patients.
- NSPT exerts a substantial effect and sustained impact on: (i) gains in clinical attachment levels; (ii) reduction in probing pocket depths; (iii) improvements in inflammatory parameters; and (iv) tooth retention.

Reference:

Sánchez IS, Carra MC, de Albornoz AC, et al. Long-term stability after nonsurgical treatment of periodontitis. Periodontol 2000. 2026; 25. https://doi:10.1111/prd.70032.

2. Effectiveness of silver diamine fluoride and fluoride varnish in arresting caries lesions in permanent molars.

A randomized controlled, blinded, clinical trial

Field: Preventive Dentistry / Paediatric Dentistry

Purpose: To compare the efficacy of 38% silver diamine fluoride (SDF) and 5% fluoride varnish (FV) in arresting caries lesions in first permanent molars in children 6-12 years old.

Key Findings:

- 38 % SDF is more effective than 5 % fluoride varnish in arresting early-stage occlusal caries lesions in first permanent molars
- The eruption stage of first permanent molars did not significantly influence treatment outcomes.
- Both SDF and fluoride varnish significantly reduced ICDAS scores from baseline, although SDF demonstrated superior effectiveness.
- SDF achieved higher caries arrest rates with a single application, whereas fluoride varnish required four weekly applications.
- SDF represents a practical and cost-effective option for managing early caries lesions in permanent molars, particularly in paediatric and public health settings.

Clinical Significance:

- SDF offers a non-invasive, highly effective, low-cost, single-session treatment option for managing early caries lesions in permanent molars.
- SDF is practical tool for paediatric dentistry and public health settings.

Reference:

Andrade SER, Piovesan ÉTA, Queiroz IQD, et al. Effectiveness of silver diamine fluoride and fluoride varnish in arresting caries lesions in permanent molars: A randomized controlled trial. J Dent. 2026; 169: 106647. https://doi.org/10.1016/j.jdent.2026.106647.

3. Timing of dental implant placement: the past, the present, the future.A clinical perspective article

Field: Implant Dentistry

Purpose: This perspective article reviews the evolution of implant placement timing, current evidence-based practices, and emerging concepts.

Key Findings:

The Past: Conventional and delayed implant placement

- Historically, delayed implant placement (3–6 months post-extraction) was considered the gold standard. The rationale for this approach was: better infection control, complete bone remodelling, and implant design limitations.
- While delayed treatment protocols achieved acceptable long-term success rates, they involved prolonged treatment duration.

The Present: Evolution towards timing classification

- The International Team for Implantology (ITI) classification system categorizes implant placement timing into four protocols:
  Type 1: Immediate placement at the time of extraction.
  Type 2: Early placement after soft-tissue healing, 4–8 weeks post-extraction.
  Type 3: Early placement after partial bone healing, 12–16 weeks post-extraction.
  Type 4: Late placement after complete bone healing, >6 month post-extraction.
- Immediate implant placement may preserve alveolar bone volume, reduce treatment time, and improve aesthetic outcomes. Careful case selection is essential to minimize complications such as midfacial recession and marginal bone loss in patients with a thin periodontal phenotype.
- Early implant placement after soft-tissue healing (Type 2) provides high survival rates, improved soft-tissue management, and reduced risk of mucosal recession, particularly in patients with a thin periodontal phenotype or sites with minor defects.
- Type 3 optimizes primary stability, minimizes infection risk, and limits the degree of alveolar ridge resorption, making it suitable for compromised sockets or sites requiring minor augmentation procedures.
- Type 4 implant placement is the most conservative protocol, offering high predictability and favourable soft-tissue outcomes in sites with extensive bone loss, previous infection, or where major augmentation procedures are required
- Implant placement in clinical practice remains complex and challenging, particularly in compromised sites and in patients with systemic or behavioural risk factors. The authors emphasize that successful osseointegration alone does not necessarily guarantee long-term functional or aesthetic treatment success.

The Future: Evolution towards personalized and biologically guided decision-making

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- Future implantology is expected to incorporate artificial intelligence (AI), digital diagnostics, regenerative biomaterials, and personalized risk assessment tools to optimize implant timing and treatment outcomes.

Clinical Significance:

- Today, timing has become a critical factor in dental implant therapy.
- The article highlights the importance of balancing patient expectations for faster treatment with biological limitations and long-term stability.

Reference:

Thoma DS, Mancini L, Jung RE. Timing of dental implant placement: the past, the present, the future. J Periodontal Res. 2026; 61(2): 101-106. https://doi.org/10.1111/jre.70088.

4. Lasers in dentistry – overview based on FDI policy statement. A Scientific Research Report – An evidence-based synthesis of laser applications in dentistry

Field: General Dentistry / Dental Technology

Purpose: To review the current evidence and clinical relevance of the applications of dental lasers across caries management, endodontics, prosthetics, orthodontics, periodontal surgery, and peri-implant therapy.

Key Findings:

- Fluorescence-based laser technologies demonstrated applications in early caries detection, subgingival calculus identification, candidiasis detection, and oral cancer screening, supporting minimally invasive and preventive dentistry.
- Erbium and CO_2 lasers supported minimally invasive caries management through selective tissue removal, improved patient comfort, enhanced enamel resistance to demineralization, and potential improvements in adhesive bonding.
- Laser-assisted endodontic protocols improved root canal disinfection, biofilm removal, irrigant penetration, smear layer removal, and substrate conditioning, while also supporting regenerative endodontic procedures.
- In prosthodontics and orthodontics, erbium lasers enabled minimally invasive debonding of crowns, veneers, and brackets while preserving underlying tooth structure.
- In periodontology and oral surgery, laser-assisted procedures improved haemostasis, wound healing, debridement, patient comfort, and clinical outcomes in crown lengthening, periodontal surgery, bone remodelling, and peri-implant therapy.
- Photobiomodulation (PBM) and photodynamic therapy (PDT) demonstrated benefits in pain reduction, wound healing, bone regeneration, antimicrobial activity, and biofilm control.
- The effectiveness of laser therapy remains dependent on appropriate wavelength selection, energy settings, clinical protocols, and operator training, underscoring the need for standardization.

Clinical Significance:

- This review provides an evidence-based synthesis of laser applications across multiple dental disciplines, aligned with the FDI Policy Statement on Lasers in Dentistry, to support safer, effective, and globally consistent clinical practice.
- Lasers are a valuable adjunct to conventional dental/oral treatment enabling minimally invasive approaches, promoting biological healing and enhancing patient comfort.
- For caries management, endodontic disinfection, periodontal therapy, prosthetics, orthodontics, and oral surgery.

Reference:

Grzech-Leśniak K. Lasers in dentistry - overview based on FDI policy statement. Int Dent J. 2026; 76(2):109369. https://doi.org/10.1016/j.identj.2025.109369.

5. Emerging risk factors influencing the occurrence of peri-implantitis. A Narrative Review

Field: Implant Dentistry / Periodontology

Purpose: This review explores the evidence and biological plausibility of factors that may increase the risk of peri-implantitis.

Key findings:

- Anatomical factors such as inadequate attached mucosa, thin buccal bone, and excessive or insufficient crestal soft-tissue thickness may increase susceptibility to peri-implant inflammation and bone loss.
- Implant-related factors, including surface roughness, implant-abutment connection design, titanium particle release, and biomechanical overloading, may contribute to peri-implantitis development and progression.
- Surgical factors such as implant malposition, shallow or excessively deep placement, tilted implants, inadequate spacing, and compromised prosthetically driven positioning were associated with increased peri-implantitis risk.
- Prosthetic factors, including convex emergence profiles, poor cleansability, cement-retained restorations, inadequate restorative contours, and insufficient transmucosal abutment height, may promote plaque accumulation and peri-implant inflammation.
- Drug- and diet-related factors, including vitamin deficiencies and medications affecting bone metabolism or immune regulation, may influence peri-implant tissue health and disease susceptibility.
- Patient-related factors such as hyperglycemia, dyslipidemia, osteoporosis, smoking, history of periodontitis or peri-implantitis, and poor supportive care compliance were associated with increased peri-implantitis risk.
- Operator-related factors, including inadequate surgical or prosthodontic training, poor treatment planning, and insufficient maintenance protocols, were identified as important contributors to peri-implant disease development.
- The authors emphasized the importance of preventing disease onset and progression through appropriate patient selection, maintenance protocols, and adequate surgical and prosthodontic education and training.

Clinical Significance:

- Early identification of risk factors and implementation of preventive measures that may affect plaque accumulation, and hard and soft tissue breakdown are essential for preventing disease onset and progression, in pursuit of long-term peri-implant health.

Reference:

Monje A, Jung RE, Valles C, Naenni N. Emerging risk factors influencing the occurrence of peri-implantitis. Periodontol 2000. 2026; https://doi.org/10.1111/prd.70031.

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