

Compiled by Johan Hartshorne¹ and Hugo Johan Kotzé²

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. Prescribing antibiotics – clinical practice guidelines

- **Field:** Pharmacology

- **Methodology:** A Worldwide Systematic Review

- **Clinical and practical significance:**

- Clinical practice guidelines are key tools for improving antibiotic prescribing.
- Antibiotic prescribing recommendations across different guidelines and countries vary significantly.
- This inconsistency, coupled with potential overprescription of antibiotics, contributes to the growing problem of antibiotic resistance.

- **Key findings:**

- Most guidelines recommend amoxicillin as a first-choice antibiotic for non-allergic patients.
- There is less agreement on alternatives for penicillin-allergic individuals.
- First-line alternatives for penicillin-allergic individuals include: Metronidazole, Azithromycin, Clindamycin, Cephalosporin, Cephalexin, and Doxycycline

- **Concluding remarks:** Quality antibiotic prescribing guidelines would facilitate clinical decision-making.

- **Reference:** Juárez-Membreño A, Figueiras A, Zapata-Cachafeiro M, Rodríguez-Fernandez A. Quality and consistency of antibiotic prescribing guidelines in dentistry: a worldwide systematic review. *J Dent.* 2025;161:105989. <https://doi.org/10.1016/j.dent.2025.105989>

2. Prevention and management of peri-implant diseases

- **Field:** Dental implantology/ Periodontology

- **Methodology:** Academy of Osseointegration (AO)/ American Academy of Periodontology (AAP) Expert Opinion Consensus Report

- **Clinical and practical significance:**

- The exponential increase in dental implant use has led to a parallel rise in biological complications and peri-implant diseases (PID).
- PID adversely affects implant therapy success, cost, and patient quality of life.

- **Key points**

- PIDs are primarily biofilm-mediated inflammatory conditions that compromise both the soft and hard tissues around implants.
- Systemic, behavioural, and local factors play a key role in the onset and progression of PID.
- Peri-implantitis represents a significant clinical challenge due to its rapidly progressive nature and the lack of standardised and predictable protocols to arrest it and treat its sequelae.

- **Evidence-based Recommendations**

- Prevention of PID through early identification and control of risk factors

Systemic: History of periodontitis, uncontrolled diabetes, and obesity.

Behavioural: Poor oral hygiene, smoking, excessive alcohol consumption.

Local site-related factors: Implant position (too buccally), inadequate mesio-distal space, thin mucosa and inadequate keratinized mucosa width, submucosal cement, buccal bone dehiscence, and unfavourable prosthetic design factors.

- Peri-implant mucositis may be effectively managed with non-surgical debridement and use of adjunctive therapies (e.g., lasers, air polishing devices, pharmacotherapeutics) and control of risk factors.

- More advanced cases of peri-implantitis require individualised surgical approaches, ranging from flap-for-access, resective, reconstructive, implant surface decontamination (air polishing devices and some lasers), or soft tissue augmentation procedures.
- Individualised and supportive peri-implant maintenance, with intervals ranging from 3-6 months, is essential for long-term peri-implant tissue stability and health.

- Patient education with emphasis on rigorous at-home hygiene for proper biofilm control is critical for long-term success.

- **Reference:** Wang HL, Avila-Ortiz G, Monje A, et al. AO/AAP consensus on prevention and management of peri-implant diseases and conditions: Summary report. *J Periodontol.* 2025;96(6): 519-541. <https://doi.org/10.1002/JPER.25-0270>

3. Does the use of intra-radicular posts reduce failure rates in endodontically treated teeth?

- **Field:** Restorative dentistry

- **Methodology:** A systematic review and meta-analysis

- **Clinical and practical significance:**

- Prefabricated or customised fibre posts are recommended for supporting coronal reconstruction in indirect restorations of endodontically treated teeth.

- In contrast, direct restorations allow for dental reconstruction without the use of intraradicular posts.

- The purpose of this study was to determine whether the use of posts reduces failure rates in endodontically treated teeth compared to restorations without posts.

- **Key findings:**

- "The use of posts is considered a favourable option for restoring endodontically treated teeth, particularly in cases characterised by diminished remaining tooth structure."

- "In the case of direct restorations, intra-radicular posts may not be necessary for dental reconstruction."

- "When intra-radicular posts are indicated for indirect restorations, prefabricated or custom fibre posts should be the preferred choice."

- **Reference:** Jardim JS, Ferreira V de M F, de Oliveira HFF, et al. Is the use of an intra-radicular post essential for reducing failures in restoring endodontically treated teeth? A systematic review and meta-analysis. *J Dent.* 2025;159:105739 <https://doi.org/10.1016/j.jdent.2025.105739>

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4. On Cracks, fractures and split teeth.

A position statement

• Field: Endodontics

• **Aim:** To provide clinicians with evidence-based, authoritative information on the etiology, clinical presentation, and management of cracks and fractures that typically manifest along the long axis of the crown and/or root.

• Key findings:

- **Prevalence** of cracked teeth as high as 70%; vertical root fractures in non-root filled teeth (6-37%); and vertical root fractures in root filled teeth (4-32%).

- **Etiology** is multifactorial involving occlusal interferences, tooth morphology, previous operative dentistry, excessive occlusal forces, and/or parafunctional habits.

- **Clinical features:** Pain to cold (37%), biting pain (16%), and spontaneous pain (11%)

- **Radiographic features:** Highly variable – subtle fracture line, peri radicular bone loss, periodontal ligament thickening. CBCT is not predictable in detecting cracks or fractures but may reveal subtle crestal bone loss if clinical and/or periapical radiographic assessment is inconclusive.

- **Prognosis:** reduced tooth survival associated with 5+ mm periodontal probing, radicular extension of cracks, location in the arch (terminal tooth), pre-operative presence of apical periodontitis, and presence or placement of an intracanal post.

Endodontic intervention:

• Key Recommendations:

- **Timely identification** of susceptible teeth and appropriate preventive management (endodontic and restorative) are essential to increase tooth survival.

- Fabrication of **occlusal stabilization** splints should be considered for the management of parafunctional habits.

- Elimination of **occlusal interferences** and reduction of excessive occlusal loading should be managed appropriately.

- **Cuspal coverage restoration** of vital as well as endodontically treated teeth to increase tooth longevity.

- **Timely extraction** should be considered to minimize development of acute symptoms and to limit bone loss.

- **Periodic monitoring** is essential for detecting early signs of peri-radicular bone loss.

• **Reference:** Patel S, Teng P-H, Liao W-C, et al. Position statement on longitudinal cracks and fractures of teeth. *Int Endo J*, 2025; 58: 379–390. <https://doi.org/10.1111/iej.14186>

5. Replacement of failed implants

• Field: Dental implantology

• **Methodology:** The study was conducted following the recommendations of the Cochrane Handbook for Systematic Reviews of Interventions and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement to ensure quality and completeness.

• Key findings

Replacement of a failed implant is an appealing treatment option, although the implant survival rate of a replacement implant is lower compared to the initially placed implant.

• Key recommendations:

- Immediate implant replacement can be done if sufficient bone is present.

- If insufficient bone remains after removal of the failed implant, immediate augmentation followed by delayed implant replacement is recommended.

• **Reference:** Gareb B. Vissink A, Terheyden H, et al. Outcomes of implants placed in sites of previously failed implants: a systematic review and meta-analysis. *Int. J. Oral. Maxillofac. Surg.*, 2025; 54(3): 268 – 280. <https://doi.org/10.1016/j.ijom.2024.10.006>

6. Does computer-assisted implant surgery (CAIS) improve accuracy of immediate implant placement (IIP)?

• Field: Dental implantology

• **Methodology:** A Systematic Review and Network Meta-Analysis

• Clinical and practical significance:

- Immediate implant placement (IIP) is a minimally invasive procedure, reducing the number of surgical interventions and overall treatment time.

- IIP is a challenging surgical procedure, which should only be performed in selected cases.

- "Precise surgical techniques, such as atraumatic tooth extraction, along with proper soft tissue management, including the use of a connective tissue graft when indicated, and accurate, prosthetically driven three-dimensional implant positioning, are critical to achieving primary stability and favourable outcomes."

- 3D implant position always matters in IIP. Any deviations from the ideal prosthetic position can result in compromised aesthetic outcomes and biologically catastrophic failures - thus, accuracy plays a predominant role.

- The planned implant position can be clinically transferred through four main approaches: (1) free-hand surgery (FH); (2) static computer-assisted implant surgery (s-CAIS) - partially or fully guided (utilizes a computer-aided manufactured surgical template to guide the drills and/or the implant in the previously planned direction); (3) dynamic computer-assisted implant surgery (d-CAIS) (utilizes a surgical navigation system that reproduces the virtual implant position, directly from computerized tomographic data, using motion tracking technology to localize implant drilling instruments and the patient's jaw position); and (4) robotic-assisted implant surgery (RAIS)."

• Conclusions and clinical implications:

- Overall, CAIS significantly increases accuracy compared to FH.

- No significant differences were found among the various CAIS techniques.

- CAIS facilitates a more predictable prosthetic-driven 3D implant positioning.

- A flapless approach was the most used method for IIP for the benefit of the patient in terms of reducing surgical treatment time and invasiveness.

- Implants with tapered and more aggressive thread designs seem to be the preferred choice to achieve primary stability.

• **Reference:** Schiavon L, Mancini L, Settecase E, et al. Does Computer-Assisted Surgery Improve the Accuracy of Immediate Implant Placement? A Systematic Review and Network Meta-Analysis. *J Periodontal Res.* 2025;60(4):1-19. <https://doi.org/10.1111/jre.70010>.