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Comprehensive Oral Prosthetics in General Dental Practice: A Narrative Review of Treatment Planning, Prosthesis Options and Clinical Outcomes: *Review Article*

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ABSTRACT

Background: Tooth loss and its functional, nutritional and psychosocial consequences remain a substantial global burden, and general dental practitioners increasingly deliver comprehensive prosthetic care that spans tooth-supported, implant-supported and removable options.

Objective: To review current evidence on comprehensive oral prosthetics performed by dentists, with emphasis on treatment planning, prosthesis selection, survival and complication rates, and patient-centred outcomes.

Methods: A narrative review was conducted in October 2026. Targeted searches identified systematic reviews, meta-analyses, consensus statements and institutional reports on tooth-supported fixed, implant-supported fixed, removable, overdenture, digitally fabricated and full-mouth rehabilitation prostheses. Findings were synthesised qualitatively.

Results: Conventional tooth-supported fixed prostheses showed five-year survival of approximately 94%, with lower survival for cantilever and all-ceramic designs. Implant-supported fixed prostheses showed five-year survival of approximately 95% but a higher burden of technical complications. Mandibular implant-supported fixed prostheses on three implants showed implant and prosthetic survival above 95% over one to six years. Consensus statements recommend the two-implant mandibular overdenture as the minimum first-choice treatment for the edentulous mandible. Evidence for removable partial dentures is limited, and evidence for full-mouth rehabilitation philosophies is dominated by case reports. Digitally fabricated complete dentures performed similarly to or better than conventional dentures.

Conclusion: Predictable outcomes in comprehensive prosthetics depend on structured diagnosis, appropriate prosthesis selection, material and design choices, and planned maintenance. Higher-quality long-term and patient-reported outcome data are still needed, particularly for removable and full-mouth rehabilitation approaches.

Keywords: prosthodontics; full mouth rehabilitation; dental implants; fixed dental prosthesis; removable dentures; edentulism

1. Introduction

Oral diseases are the most widespread health conditions worldwide. The World Health Organization estimated in 2022 that approximately 3.5 billion people are affected by oral diseases, and identified severe tooth loss among the leading contributors to the global burden of oral disease [1]. Tooth loss impairs mastication, speech, appearance and social participation, and the demand for prosthetic replacement is expected to grow as populations age and retain more teeth for longer.

Comprehensive oral prosthetics describes the planned, whole-mouth management of missing or structurally compromised dentition using fixed, removable and implant-supported prostheses, often in combination. Unlike single-tooth restorations, comprehensive care requires the clinician to integrate periodontal, occlusal, restorative, surgical and patient-specific factors into one sequenced treatment plan. In many settings, including private general practice in South Africa, this work is performed by general dentists, sometimes in collaboration with specialist prosthodontists and dental technicians.

The prosthodontic literature is large but fragmented. Individual systematic reviews address single prosthesis types, whereas clinicians must choose among them for a given patient. Outcome reporting has also been inconsistent, which led an international group to propose standardised, patient-centred outcome domains covering longevity, function, psychological effects and cost [2]. A concise synthesis that places the main prosthesis categories side by side may therefore support everyday clinical decision-making.

The objective of this review was to summarise current evidence on comprehensive oral prosthetics as performed by dentists, addressing (i) diagnosis and treatment planning, (ii) survival and complication rates of the principal prosthesis categories, and (iii) gaps in the evidence that should temper clinical expectations.

2. Materials and Methods

2.1 Study design

This work is a narrative review. It was not conducted as a registered systematic review and does not report a pooled quantitative analysis. Its purpose is to give a structured, clinically oriented overview rather than an exhaustive enumeration of the literature.

2.2 Search strategy

Targeted searches of the indexed and open-access literature were carried out in October 2026 using a web-based search tool. Search terms combined prosthodontic and design concepts, for example: full mouth rehabilitation, oral rehabilitation, fixed dental prosthesis, implant-supported fixed complete denture, removable partial denture, implant overdenture, CAD/CAM complete denture, monolithic zirconia, and occlusal vertical dimension, together with the terms systematic review, meta-analysis and consensus statement. Searches for the oral disease burden used the title of the World Health Organization global report.

2.3 Selection of sources

Priority was given to systematic reviews, meta-analyses, consensus statements and reports from international bodies. Primary clinical reports were not used as stand-alone evidence. Sources were included when they addressed a prosthesis category relevant to comprehensive care, reported survival, complication or patient-reported outcomes, or described standards of care. Selection was based on the author's judgement of relevance and methodological standing, and no formal risk-of-bias tool was applied.

2.4 Data extraction and synthesis

Key characteristics and outcome figures were extracted from each included source and are reported as stated by the original authors. Where the full text of a source was not accessible, data were taken from the published abstract, and only figures stated explicitly in the abstract are reported. Findings were grouped by prosthesis category and synthesised qualitatively.

2.5 Ethical considerations

This review used only published literature. No patients, patient records or identifiable personal data were involved, so ethical approval and informed consent were not required.

3. Results and Discussion

3.1 Diagnosis, treatment planning and outcome measures

Comprehensive prosthetic care begins with diagnosis and a staged plan rather than with prosthesis choice. Historically, several philosophies have guided the rehabilitation of worn or compromised dentitions, including the Pankey-Mann-Schuyler approach and the Hobo twin-stage and twin-table techniques. A systematic review of these philosophies, covering the literature from 1960 to 2018, retained 32 articles, of which only eight were original research studies and the remainder were case reports [3]. The authors concluded that the evidence base for choosing between philosophies is weak. In practice, this means that the choice of technique rests largely on clinician experience and on the severity and classification of the individual case, rather than on comparative trial data.

The same evidence gap applies to outcome measurement. The Oral Rehabilitation Outcomes Network highlighted the need for standardised outcomes across longevity, functional, psychological and economic domains that can be used in both institutional and practice-based settings [2]. For the practising dentist, this supports recording not only prosthesis survival but also function, comfort, appearance and cost to the patient as part of routine follow-up.

3.2 Tooth-supported fixed prostheses

A systematic review comparing prosthesis types estimated five-year survival at 93.8% for conventional tooth-supported fixed dental prostheses (FDPs) and 91.4% for cantilever FDPs, falling to 89.2% and 80.3% respectively at ten years [4]. A dedicated review of cantilever designs reported ten-year survival of 81.8% and a success rate, defined as freedom from all complications, of only 63%, lower than for conventional end-abutment FDPs [7]. These figures support a cautious approach to cantilever extensions in comprehensive plans, particularly where abutment support is already compromised.

Material selection also influences longevity. In a review of multiple-unit FDPs, estimated five-year survival was 94.4% for metal-ceramic restorations, compared with 90.4% for densely sintered zirconia, 89.1% for reinforced glass ceramic and 86.2% for glass-infiltrated alumina, and the authors concluded that all-ceramic FDPs showed lower survival than metal-ceramic FDPs [5]. A companion review addressed single crowns [6]. Resin-bonded FDPs have also been assessed at follow-up of at least five years and remain a conservative option where suitable [8]. Because zirconia technology continues to evolve, these figures should be read as a snapshot of the studies available to those reviews rather than as a ceiling for newer materials.

3.3 Implant-supported fixed prostheses

For partially edentulous patients, a systematic review with a mean observation of at least five years estimated implant survival of 95.6% at five years and 93.1% at ten years, and survival of implant-supported FDPs of 95.4% at five years and 80.1% at ten years [9]. When older gold-acrylic designs were excluded, survival of metal-ceramic implant-supported FDPs was 96.4% at five years and 93.9% at ten years [9]. The same group reported earlier that 38.7% of patients with implant-supported FDPs experienced some complication within five years, and that technical complications were significantly more frequent than for tooth-supported reconstructions [4]. High survival therefore does not mean low maintenance, and patients should be counselled that repair and recall are expected parts of implant prosthodontics.

For the edentulous arch, a meta-analysis of mandibular full-arch fixed prostheses supported by three implants reported a mean implant survival of 95.9% and prosthetic survival of 97.0% over one to six years, and the authors considered this a viable option compared with designs using more implants [10]. A systematic review of implant-supported fixed prostheses used for full-mouth rehabilitation found that clinical results were significantly influenced by prosthesis design, the manufacturing process and the restorative material, with marginal bone loss of 2 mm the most commonly reported biological outcome [11]. Complete-arch monolithic zirconia prostheses showed high survival and minimal complications at a mean follow-up of around four years in a review of seven studies [12]. These short follow-up periods mean that long-term chipping, wear and screw-related complications remain insufficiently characterised.

3.4 Removable prostheses and overdentures

The McGill consensus statement of 2002 concluded that a two-implant mandibular overdenture should be the first-choice standard of care for the edentulous mandible [13]. A later consensus in York reviewed accumulated evidence and stated that a two-implant mandibular overdenture should be the minimum offered to edentulous patients as a first choice of treatment [14]. For dentists working in settings where cost limits access to implant treatment, these statements are important, because they define what an ideal baseline would be even when a conventional denture is ultimately chosen.

Evidence for removable partial dentures (RPDs) is weaker. A systematic review of removable dentures in the moderately reduced dentition, which included 19 publications, found failure rates of 33% to 50% at five years for cast-metal framework dentures and 0% to 21.7% at three to six years for double-crown dentures [15]. The authors noted that evidence-based therapeutic recommendations for removable dentures are still lacking, but that with suitable pretreatment and follow-up they can provide satisfactory solutions [15]. This supports treating RPDs as a legitimate and often cost-effective option while recognising that high-level comparative evidence is limited.

Digital fabrication has also entered removable prosthodontics. A systematic review and meta-analysis of 73 studies on milled and three-dimensionally printed complete dentures concluded that CAD-CAM complete dentures should be considered for completely edentulous patients whenever possible [16]. Dentists adopting digital workflows should nevertheless continue to apply fundamentals such as accurate impressions, jaw relation records and try-in of the arrangement, since digital manufacturing does not remove the need for sound clinical steps.

3.5 Full-mouth rehabilitation of the worn dentition and vertical dimension

Where tooth wear is severe, comprehensive rehabilitation may require an increase in the occlusal vertical dimension (OVD). A recent systematic review asked whether a period of evaluating the new OVD, for example with provisional restorations, improves outcomes, and found a lack of evidence that an evaluation period improves clinical or patient-reported outcomes; the authors concluded that an increase in OVD can be successful with or without an evaluation phase [17]. This does not mean that careful diagnostic wax-ups and provisional phases are unnecessary, only that their benefit has not been demonstrated in the available literature. The evidence base for rehabilitation philosophies is predominantly case reports [3], so clinicians should be transparent with patients about the level of evidence behind the chosen approach.

3.6 Summary of reported evidence

Table 1 summarises the principal findings discussed above. Figures come from different reviews with different inclusion criteria, follow-up periods and definitions of survival and success, and should therefore be compared across rows with caution.

Table 1. Summary of reported survival, complication and consensus findings by prosthesis category.

Prosthesis category	Key reported finding	Ref.
Tooth-supported fixed (conventional)	Estimated five-year survival 93.8% for conventional FDPs and 91.4% for cantilever FDPs; ten-year survival 89.2% and 80.3% respectively.	[4]
Tooth-supported fixed (material)	Five-year survival of multiple-unit FDPs: metal-ceramic 94.4%; densely sintered zirconia 90.4%; reinforced glass ceramic 89.1%; glass-infiltrated alumina 86.2%.	[5]
Cantilever fixed	Ten-year survival 81.8% and success (free of all complications) 63%.	[7]
Implant-supported fixed (partial)	Implant survival 95.6% at five years and 93.1% at ten years; FDP survival 95.4% at five years and 80.1% at ten years; metal-ceramic FDPs 96.4% and 93.9%.	[9]
Implant-supported fixed (mandibular full arch, three implants)	Mean implant survival 95.9% and prosthetic survival 97.0% over one to six years of follow-up.	[10]
Implant-supported fixed (full arch, monolithic zirconia)	High survival and minimal complications at a mean follow-up of about four years (seven studies).	[12]
Implant overdenture (mandibular)	Consensus: two-implant mandibular overdenture is the first-choice standard of care and the minimum offered to edentulous patients.	[13,14]
Removable partial denture	Cast-metal framework failure 33% to 50% at five years; double-crown dentures 0% to 21.7% at three to six years.	[15]
Digital (CAD-CAM) complete denture	Concluded that CAD-CAM complete dentures should be considered for completely edentulous patients whenever possible.	[16]

FDP, fixed dental prosthesis; CAD-CAM, computer-aided design and computer-aided manufacturing. Values are reproduced as stated in the cited reviews.

3.7 Implications for clinical practice

Several practical points follow from the evidence. First, treatment plans should be staged and documented, with an explicit rationale for each prosthesis choice. Second, patients should be told that survival figures describe the prosthesis remaining in function, not freedom from complications, and that technical complications are common with implant-supported prostheses [4]. Third, cantilever extensions and some all-ceramic designs carry measurably lower survival than conventional metal-ceramic designs in the reviewed studies [5,7]. Fourth, cost-conscious options such as RPDs and mandibular overdentures remain well supported as part of a comprehensive menu of choices [14,15]. Finally, a recall programme is an integral part of the prosthesis, not an optional addition.

3.8 Limitations of the evidence and of this review

This review has several limitations. It is narrative rather than systematic, no formal quality appraisal was applied, and the searches were targeted rather than exhaustive, so relevant studies may have been missed. Where full texts were not accessible, data were taken from abstracts. Most included sources are reviews of clinical studies with follow-up between one and ten years, with heterogeneous definitions of survival and success, so figures cannot be directly pooled or ranked. Evidence for rehabilitation philosophies and for removable prostheses is of lower quality than that for implant-supported fixed prostheses. The review did not identify South African outcome data, and the generalisability of international findings to local practice, patient populations and cost constraints cannot be assumed. Future work should include prospective practice-based studies using standardised outcome domains [2].

4. Conclusion

Comprehensive oral prosthetics offers dentists a range of options with generally good short- to medium-term survival, but with important differences in complication burden, durability and strength of evidence. Conventional metal-ceramic tooth-supported prostheses, implant-supported fixed prostheses and mandibular implant overdentures are each supported by reasonably consistent review-level evidence, whereas removable partial dentures and full-mouth rehabilitation philosophies rest on weaker data. Predictable results depend on structured diagnosis, appropriate prosthesis selection, informed

consent that includes the likelihood of maintenance and repair, and planned recall. Adoption of standardised, patient-centred outcome measures in practice would help to close the remaining evidence gaps.

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7. Conflict of Interest

The author declares that there are no financial, professional, institutional or personal conflicts of interest that could have influenced this work.

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