

Health Technology Review

Flexible Dentures for Edentulism

Key Messages

What Is the Issue?

- Partial and complete edentulism, or tooth loss, affects millions of people in Canada. It can influence the ability to chew and speak, change facial structure and appearance, and affect physical and mental health. Treatment options for edentulism include removable partial and complete dentures.
- Removable denture bases are conventionally made with acrylic or cast metal. Newer materials, including thermoplastics, are of more interest as they create more flexible dentures and may provide better function, aesthetics, and comfort. However, they may be more expensive than conventional dentures.
- The relative clinical and cost-effectiveness of removable flexible thermoplastic dentures compared to conventional dentures is unclear. The need for this review was identified by a policy decision-maker, and this review is a response to that request.

What Did We Do?

- We conducted a Rapid Review to summarize evidence comparing the clinical effectiveness and cost-effectiveness of removable partial or complete flexible dentures to removable conventional (acrylic or metal) partial or complete dentures. We also sought to identify evidence-based guidelines regarding the use of removable partial or complete flexible dentures for this patient population.
- We searched key resources, including journal citation databases, and conducted a focused internet search for relevant evidence published since 2019. We also screened literature included in a previous Canada's Drug Agency (formerly CADTH) report.

What Did We Find?

- We identified 7 randomized controlled trials and 1 nonrandomized controlled study evaluating the clinical effectiveness of removable flexible partial or complete dentures compared to removable conventional partial or complete dentures. No cost-effectiveness evaluations or evidence-based guidelines that met our inclusion criteria were identified.
- No identified studies were conducted in Canada; studies were conducted in Africa, Asia, and Europe and included diverse participants in terms of number and locations of missing teeth, and diverse denture materials.

Key Messages

- Findings from the included studies suggest that, compared to removable conventional dentures, removable flexible dentures may improve several clinical outcomes (e.g., aesthetics and overall satisfaction), may be comparable for others (e.g., speech, pain while eating, and prosthesis fractures or discoloration), and may be inferior for others (e.g., denture retention). The comparative clinical effectiveness between these devices for other outcomes (e.g., chewing ability, oral health-related quality of life, and effort for maintenance) was inconsistent across studies and measurement methods.
- The included clinical studies may be at risk of bias given that many outcomes were measured subjectively with methods of unknown validity, and patients and outcome assessors were aware of the treatments received. We did not identify studies with sufficient follow-up to inform the relative durability of these devices over a denture's lifespan, and there is uncertain generalizability of the evidence to the context in Canada.

What Does This Mean?

- The evidence informing the comparative clinical effectiveness of removable partial or complete flexible dentures and removable partial or complete conventional dentures is inconsistent across the outcomes of primary interest to patients, clinicians, and payers. While there is evidence that removable flexible dentures may be similar or superior to removable conventional dentures for some outcomes, they may be inferior for others. Due to their relative cost, comparative cost-effectiveness research would help inform the potential role of these denture options in Canada.
- Future research should focus on large, well-designed clinical trials and cost-effectiveness research in health systems within Canada with validated outcome measurement tools, clear reporting, and longer follow-up. Additionally, it is important to explore the relative value placed on outcomes for different groups, including patients, clinicians, and payers and how these may differ by factors such as age, degree of edentulism, access to technology and materials, and access to oral health care services and insurance.

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Abbreviations

Cr-Co	cobalt-chromium (alloy)
OHIP	Oral Health Impact Profile
OHRQoL	oral health-related quality of life
PMMA	polymethyl methacrylate (acrylic)
RCD	removable complete denture
RCT	randomized controlled trial
RPD	removable partial denture
SES	socioeconomic status
VAS	visual analogue scale

Key Terminology

Health equity: Equity is the absence of unfair, avoidable, or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically or by other dimensions of inequality (e.g., sex, gender, ethnicity, disability, or sexual orientation). Health is a fundamental human right. Health equity is achieved when everyone can attain their full potential for health and well-being. Health and health equity are determined by the conditions in which people are born, grow, live, work, play, and age, as well as biological determinants. Structural determinants (political, legal, and economic) with social norms and institutional processes shape the distribution of power and resources determined by the conditions in which people are born, grow, live, work, play, and age.¹

PROGRESS-Plus: An acronym used to identify characteristics that stratify health opportunities and outcomes. PROGRESS refers to place of residence, race/ethnicity/culture/language, occupation, gender/sex, religion, education, socioeconomic status, and social capital. Plus refers to personal characteristics associated with discrimination (e.g., age, disability), features of relationships (e.g., smoking parents, excluded from school), and time-dependent relationships (e.g., leaving the hospital, respite care, other instances in which a person may be temporarily at a disadvantage).²

Racialized: A person or group of people categorized according to ethnic or racial characteristics and subjected to discrimination on that basis.³

Research Questions

1. What is the clinical effectiveness of removable partial or complete flexible dentures compared to removable partial or complete conventional dentures for edentulism?
2. What is the cost-effectiveness of removable partial and complete flexible dentures compared to removable partial or complete conventional dentures for edentulism?
3. What are the evidence-based guidelines on the use of removable partial or complete flexible dentures?

Context and Policy Issues

What Is Edentulism?

The term edentulism refers to both the loss of all natural teeth (complete edentulism) and the irreversible loss of 1 or more natural teeth (partial edentulism).⁴⁻⁶ Complete edentulism affects approximately 4% to 8% of adults in Canada;^{7,8} worldwide, it affects an estimated 350 million people,⁴ and there is substantial global variation in prevalence.^{8,9} Causes of tooth loss include trauma, genetic diseases, oral cancer, and periodontal disease, the last of these being the most common. Prevention of periodontal disease includes ensuring equitable access to oral health care services and promoting personal oral hygiene.

Prevalence of edentulism increases with age^{4,5,7} and global rates of edentulism are projected to increase with aging populations and population growth.^{4,10} Other factors associated with edentulism include a history of smoking,^{5,7} engagement in high-risk activities such as contact sports or working in high-risk environments (e.g., military), being female (although associations are inconsistent),^{4,5,7} having a lower socioeconomic status (SES) or level of education,^{4,5} and race or ethnicity.^{5,7} Reported disparities for the latter are inconsistent between countries and may reflect social and health inequities, including inequitable access to health insurance or oral health care services, rather than differential biological risk.¹¹ While Canada has 1 of the highest per capita expenditures for oral health globally,¹² it has high rates for both absolute and relative inequality for edentulism compared to some other high-income countries.¹³ Those seeking care for oral health problems are also more likely to have higher income levels and access to dental insurance, most often covered by private insurance plans.^{14,15}

Tooth loss can affect overall health, quality of life, and mental health.^{4,16} Whether partial or complete, it can affect chewing ability and the ability to speak clearly; these, in turn, can affect food choices, nutritional intake, social engagement, and well-being. Tooth loss can also change facial shape, through anatomic changes to the jaw bones, tissues, or position of the remaining natural teeth, and this may impact self-esteem. A qualitative systematic review examined, in part, the experiences of those with tooth loss, and key themes were its perceived effect on chewing, speaking, appearance, social position, and confidence.¹⁷

Removable Dentures for Edentulism

Dentures are devices used to replace missing teeth. They may replace a few teeth (partial dentures), an entire arch of missing teeth on either mandibular or maxillary arches, or all teeth (complete or full dentures). Available denture options include fixed or removable prostheses and those with and without implants. Removable, non-implant-supported dentures, whether removable partial dentures (RPDs) or removable complete dentures (RCDs) are popular as they typically cost less than implant-supported dentures, do not require surgery, and are less dependent on the health of bones and gums.¹⁸⁻²¹ Dentures may increase the ability to chew and speak; decrease changes to facial shape; and improve health, social, and mental well-being compared to no intervention. The authors of a qualitative systematic review¹⁷ reported that users of RPDs often viewed their dentures as a “gift” and that it helped achieve “an ideal.”

Different materials may be used to manufacture removable dentures and acrylic or cast metal are common options. Acrylic dentures, frequently manufactured using polymethyl methacrylate (PMMA), typically cost less, whereas cast metal dentures, frequently manufactured using chromium-cobalt (Cr-Co) or nickel-chromium alloys, are typically stronger and less bulky than acrylic options.^{22,23} However, both options can cause discomfort and irritate the gums or oral tissues; they may require professional adjustments, care, and maintenance, and can be prone to damage or loss of retention over time. They also often use metal clasps to anchor the denture in the mouth, which may be perceived as aesthetically disadvantageous.

More recently, removable dentures made with thermoplastics are of interest; these include thermoplastic nylons, polyamides, and acrylics.^{22,23} Examples of commercial options for thermoplastic dentures available in Canada include Valplast, Duraflex, and TCS.²⁴ These materials are attractive alternatives to acrylic and cast metal because they are more flexible, allowing them to adapt more easily to changes in the mouth shape,

such as when chewing.²³ Literature reviews typically also cite them as being more compatible with living tissue (e.g., less toxic or reactive), resistant to water absorption, and durable than conventional options, although the conclusions of literature overviews are inconsistent.^{22,23} The denture base and clasps are also translucent, appearing more natural, and the absence of metal elements provides options in the case of allergies or sensitivity. However, thermoplastic dentures tend to be more expensive than conventional options such as acrylic or metal, and some sources suggest that they may not be suitable for people with more extensive tooth loss.^{22,23,25} Additionally, the relative durability of removable flexible dentures in terms of risk of fractures, retention, and maintenance of colour compared to removable conventional dentures is unclear.^{22,25}

Why Is It Important to Do This Review?

Thermoplastic resin removable dentures may offer advantages to people with edentulism in terms of aesthetics or comfort, but they typically cost more than removable dentures made from acrylic or metal, and their comparative long-term durability is unclear. As the various options may not all be equally accessible due to cost or insurance coverage, understanding their relative clinical effectiveness and cost-effectiveness informs decision-making. We previously published a Rapid Response (summary of abstracts) in 2019 reviewing the clinical effectiveness, cost-effectiveness, and guideline recommendations on the use of removable partial or complete flexible dentures for edentulism.²⁶ This was a summary of abstracts with no critical appraisal of the evidence and identified no economic evaluations or evidence-based guidelines with which to inform practice or policy. A policy decision-maker indicated a need for an update of the previous review to support evidence-informed decision-making regarding the available options, including newer technologies, if relevant. This review is a response to that request.

Objectives

To support decision-making, we prepared this Rapid Review to identify, summarize, and critically appraise available evidence regarding the clinical effectiveness and cost-effectiveness of flexible RPDs and RCDs compared to conventional RPDs or RCDs for edentulism. This review also aimed to summarize the related guideline recommendations available for this patient population.

Methods

Included studies from a previous Canada's Drug Agency (CDA-AMC) (formerly CADTH) report²⁶ were screened for eligibility. In addition, an information specialist conducted a customized literature search, balancing comprehensiveness with relevance, of multiple sources and grey literature on August 1, 2025. One reviewer screened citations and selected studies based on the inclusion criteria presented in [Table 1](#). Included studies were critically appraised by 1 reviewer using established critical appraisal tools. [Appendix 1](#) presents a detailed description of methods and selection criteria for included studies.

Table 1: Selection Criteria

Criteria	Description
Population	People of all ages, in any setting, with partial or complete edentulism
Intervention	Flexible nonacrylic, nonmetal partial or complete dentures, using thermoplastic materials, including: • Thermoplastic polycarbonate • Thermoplastic polyamide • Thermoplastic acrylic • Thermoplastic nylon or nylon-like material • Thermoplastic resin
Comparator	Q1 and Q2: Conventional partial or complete dentures, using acrylic or acrylic with metal ^a Q3: Not applicable
Outcomes	Q1: Clinical effectiveness (e.g., wear resistance and longevity, masticatory function, fit and comfort, quality of life, side effects, adverse events) Q2: Cost-effectiveness (e.g., incremental cost per health benefit gained, cost per patient adverse events avoided, cost-minimization) Q3: Guidelines on appropriate use and recommendations regarding best practices (e.g., appropriate patient populations, contraindications)
Study designs	Q1: Health technology assessments, systematic reviews, randomized controlled trials, nonrandomized controlled studies ^b Q2: Economic evaluations Q3: Evidence-based guidelines
Publication date	2009 to present

^aImplant-supported removable dentures (i.e., snap on) and thermoplastic resin dentures incorporating metal elements (e.g., for framework or clasps) were not eligible for this review.

^bLimited to interventional studies.

Summary of Evidence

Quantity of Research Available

This report includes 9 publications²⁷⁻³⁵ of 8 studies meeting our inclusion criteria, comprising 5 studies^{29,31,33-35} identified from the previous CDA-AMC report,²⁶ 2 from our current updated search^{27,28} and 2 reports^{30,32} (1 companion to an existing included study³⁰) from a systematic review³⁶ identified during screening. We excluded 3 studies from the current Rapid Review that had been included in the previous CDA-AMC report:²⁶ 2 due to updated study eligibility criteria for the current Rapid Review^{37,38} and 1 due to an ineligible intervention.³⁹

Nine publications were included for question 1: 7 randomized controlled trials (RCTs)^{27-30,32-35} and 1 study for which the reporting on study group allocation methods was unclear.³¹ We have included this as a nonrandomized controlled trial because study authors briefly refer to “experimental groups,” although it is possible that it is an observational study. We discuss the potential implications of this decision in the Limitations section of this review.

We did not identify relevant evidence regarding the cost-effectiveness of removable flexible dentures compared to removable conventional dentures that addressed question 2. We excluded 1 economic evaluation⁴⁰ from this analysis, conducted in an educational institution in India, which compared the cost-effectiveness of thermoplastic resin RPDs with metal clasp-retained and cast metal RPDs because it was not considered generalizable or transferable to the health care context in Canada.

We did not identify any evidence-based clinical practice guidelines providing recommendations on the use of removable partial or complete flexible dentures for edentulism (question 3) that met the inclusion criteria for this report; therefore, no summary is provided.

[Appendix 2](#) presents the PRISMA⁴¹ flow chart of the study selection.

Summary of Study Characteristics

[Appendix 3](#) provides details regarding the characteristics of included publications.

Included Studies for Question 1: Clinical Effectiveness of Removable Flexible Dentures Compared to Removable Conventional Dentures

We identified 9 publications, including 4 parallel-group RCTs,^{28,32,33,35} 4 publications of 3 crossover RCTs,^{27,29,30,34} and 1 nonrandomized controlled study³¹ addressing this research question. Two reports^{29,30} corresponded to 1 study, and the report authors reported different outcome measures (patient satisfaction,³⁰ oral health-related quality of life²⁹) at the same time point in the same study population. The included studies were published between 2015 and 2022, were conducted in Egypt,³² India,^{28,35} Italy,³¹ Nigeria,^{27,29,30} Poland,³⁴ and Saudi Arabia,³³ and were most often conducted within outpatient clinics and in university hospital settings. Study sample sizes ranged between 10 and 120 participants, and the longest follow-up for each study was as follows: 1 month,^{29,30} 3 months,^{27,34} 6 months,³³ 1 year,^{28,31} 1.5 years³⁵ (with unclear timing for outcome assessments), and 24 months³² (this study assessed most outcomes after 3 months).

Dentition status varied across the studies in both the number and location of missing teeth (e.g., Kennedy classification) with 6 studies limited to participants with partial tooth loss on a single dental arch (maxillary,³¹ mandibular,^{28,32} or either arch^{29,30,34,35}), 1 study limited to those with complete loss on 1 arch (maxillary²⁷), and 1 study limited to those with complete loss on both arches.³³ Two studies²⁸⁻³⁰ excluded individuals with a previous history of denture use, whereas eligibility based on previous denture use was not explicitly stated in the other reports.

When reported, studies limited participants to those aged at least 16 years,^{29,30} between 30 and 70 years,²⁸ and 65 years and older,³¹ and the mean participant age (based on reported means or ranges) was younger than 60 years in 6 studies.^{28-30,32-35} Sex or gender was reported in 5 studies: the authors of 3 studies reported the proportion of females (ranging from 50% to 60%);^{27,28,31} the authors of 1 study reported the proportion of males (50%);^{29,30} the authors of 1 study reported the number of men and women;³⁴ and the authors of 3 studies did not report sex or gender distributions.^{32,33,35} No other sex or genders were reported, and no report defined these terms. While not frequently reported, diversity in participant race or ethnicity may be present across studies due to the studies' country settings. Akinyamoju et al.^{29,30} reported participants' place of residence (urban or suburban), proportions of participants from select Nigerian tribes, and the level

of completed education, marital status, and SES. Hundal and Madan³⁵ also reported SES. The authors of 6 studies did not report other factors associated with health equity, and no report authors reported other PROGRESS-Plus criteria,² including occupation or religion. Most studies included only participants with good overall health status, with some excluding participants based on specific health conditions (chemotherapy,^{27,31} temporomandibular disorders,³⁴ movement disorders,³³ diabetes,³¹ psychiatric disease,³³ or systemic medical conditions²⁸).

The types of removable dentures evaluated and compared also varied. Two studies compared flexible RCDs to conventional heat-cured acrylic resin RCDs^{27,33} and 3 studies compared flexible RPDs (including thermoplastic polyamide, thermoplastic acetyl) to either acrylic RPDs,^{29,30} cast metal RPDs (e.g., Cr-Co alloy),²⁸ or both.³¹ Macura-Karbownik et al.³⁴ compared flexible RPDs to both acrylic RPDs and RPDs with acetal frameworks and clasps and an acrylic base. Sadek and Elawady³² compared Thermopress RPDs (specific thermoplastic material not stated) to cast metal RPDs with and without a surveyed bridge. The reports often described the denture design and manufacturing process in detail or provided references to design methodology, although this has not been extracted for this report.

The authors of the included studies reported a wide range of outcomes and, in the absence of a known core outcome set for nonimplant dentures, we categorized them using a subset of consensus core outcome domains from implant dentistry.⁴² The following clinical outcomes were extracted:

- pathophysiology
 - masticatory function — up to 3 months,^{32,34} 6 months,³³ and 1 year³¹
 - aesthetics — up to 1 month,^{29,30} 1 year,³¹ and 1 study with unclear timing of outcome assessment³⁵
 - phonetics or speech — up to 1 month^{29,30} and 1 year³¹
 - denture retention — up to 3 months²⁷ and 1 year³¹
 - complications (e.g., injuries to adjacent structures, infection, pain, and plaque on teeth or prosthesis) — up to 1 month,^{29,30} 1 year,³¹ and 24 months³²
 - tissue health (e.g., health of mucosa or gingival tissue) — up to 1 year³¹ and 1 study with unclear timing of outcome assessment³⁵
- prosthesis lifespan
 - technical complications (e.g., survival rate, fracture, or loss of retention of prosthesis or components, discoloration) — up to 1 year³¹ and 1 study with unclear timing of outcome assessment³⁵
- life impacts
 - overall satisfaction with treatment (e.g., visual analogue scale [VAS], Likert scale) — up to 1 month³⁰ and 1 study with unclear timing of outcome assessment³⁵
 - oral health-related quality of life (OHRQoL) — up to 1 month,²⁹ 3 months,³² and 1 year²⁸
 - effort for maintenance (e.g., outcomes related to self-performed or professional visits for oral hygiene) — up to 1 month³⁰ and 1 year.³¹

Summary of Critical Appraisal

[Appendix 4](#) provides additional details about the strengths and limitations of the included publications.

Included Studies for Question 1: Clinical Effectiveness of Removable Flexible Dentures Compared to Removable Conventional Dentures

We identified 4 parallel-group design RCTs,^{28,32,33,35} 3 crossover RCTs,^{27,29,30,34} and 1 nonrandomized controlled study³¹ that met the eligibility criteria for this research question. A detailed review of the critical appraisal is provided in [Appendix 4](#).

The reporting quality of these studies varied. All reports clearly described the objectives, the main outcomes, and the study findings. No report referenced protocols or registration records, and to what extent results or analyses were prespecified is unclear. Seven studies^{27-32,34,35} clearly described the eligibility criteria and the details of the interventions (or provided a supplementary reference), whereas 1 report did not describe either.³³ Estimates of random variability for the main outcomes were provided in reports of 6 studies^{27-30,33-35} but not in 2.^{31,32} The authors of 4 reports included some adverse events or reported no losses due to harms,^{28,31,32,35} and 4 did not mention adverse events.^{27,29,30,33,34} P values were reported for the main outcomes in reports of 6 studies^{27-31,33,34} but not in 2.^{32,35}

The risk of selection bias in these studies is unclear. The authors of all studies reported recruiting participants in each arm from the same population over the same time period, except for Hundal and Mudan,³⁵ who did not report the time frame of recruitment. The authors of all studies except 1³¹ described randomly allocating participants to intervention groups, but the authors of only 3 studies²⁷⁻³⁰ described randomization procedures, of which the authors of only 1 study²⁸ described a concealed randomized sequence. When reported, the studies appeared balanced for key variables at baseline, although the authors of 4 studies, all of which were parallel-group RCTs, reported few baseline characteristics^{31-33,35} and did not adjust for potential confounders (e.g., age, gender, race); whether these factors were balanced or could have a potential impact on the main findings is unclear.

All studies were at risk for performance bias, and 6 studies were at risk for measurement bias.^{27-32,35} Although masking participants and outcome assessors to the interventions received is difficult or not possible between the comparisons of interest, none of the studies' authors reported that they attempted to conceal interventions or study objectives from participants or outcome assessors, and this may have impacted the use of, or perceptions related to, the devices. Although contamination across study arms was not expected, none of the studies' authors reported how often participants used their prosthesis(es) or if they followed cleaning and maintenance instructions, where relevant. Carryover effects were not a primary concern for crossover studies^{27,29,30,34} and there were no washout periods. Measurement bias was primarily a concern for subjective outcomes, such as participant self-perceived quality of life or satisfaction. While the main outcome measures appear to be valid and reliable (e.g., measuring what they intend to measure with reproducible results) in 4 studies,^{28-30,33,34} those in the other 4 pose some concern. For example, Hundal and Madan³⁵ did not report the time point of outcome measurement (or the period of recall required), and most outcomes were assessed using single questions with qualitative responses that were converted to scores, the validity

of which is unclear. Others posed questions from seemingly unvalidated instruments³¹ or selected questions from multiple validated instruments.³²

Seven studies had similar lengths of follow-up across study arms²⁷⁻³⁴ or adjusted for differences in the analysis.³² One study³⁵ did not report the follow-up and outcome assessment timing clearly. The authors of 1 study reported no losses to follow-up,²⁸ the authors of another study (2 reports) reported few losses, which were unlikely to impact the results,^{29,30} and the authors of 6 studies did not report whether there were losses to follow-up.^{27,31-35} The authors of 2 studies^{29,30,33} reported conducting power or sample size calculations for the primary outcomes, although neither reported the minimum clinical difference used in this calculation; the power of other studies to detect clinically meaningful differences is unclear. In 2 studies,^{32,34} an adjustment was made for multiplicity in analyses.

Studies were primarily conducted in university hospital or military settings in Africa, Asia, Europe, in countries with racial distributions and social and health inequalities that may differ from the context in Canada. Their generalizability (external validity) to other populations and dental care settings, including to those in Canada, is unclear. The authors of 2 studies^{27,29,30} reported recruiting consecutive patients over a set period of time; the authors of 2 studies^{33,35} reported recruiting a random sample of individuals presenting to their institution, but neither mentioned the selection method; and, for the remainder,^{28,31,32,34} reports did not describe participant selection or the representativeness of the study population to the source populations. The authors of all but 1 study³⁴ reported seeking consent, but no report described the numbers or characteristics of those declining consent, if relevant.

The authors of 4 studies^{29,30,32,33,35} declared they had no conflicts of interest relevant to the research, and the authors of 4 studies made no statement related to conflict of interest.^{27,28,31,34} The authors of 4 studies declared the absence of study-specific funding^{28-30,32,33}, and authors of the other 4 studies^{27,31,34,35} did not disclose receipt of funding or, if relevant, the source.

Summary of Findings

[Appendix 5](#) presents additional details regarding the main study findings.

Question 1: Clinical Effectiveness of Removable Flexible Dentures Compared to Removable Conventional Dentures

Pathophysiology

Masticatory Function

Masticatory function was reported in publications of 2 parallel-group RCTs,^{32,33} 1 crossover RCT,³⁴ and 1 nonrandomized controlled study³¹ and included both objective and subjective outcome measures ([Table 4](#)). Overall, the evidence of the effectiveness of removable flexible dentures compared to conventional dentures for outcomes of masticatory function was inconsistent across studies, including between different objective measures.

- Occlusal force, measured by dynamometer, was significantly lower after 3 months with flexible RPDs compared to conventional RPDs (acetal or PMMA).^{33,34}

- Maximum bite force, measured by occlusal force metre, was significantly higher after 6 months with flexible RCDs compared to conventional RCDs (acrylic).³³
- Chewing efficiency, defined based on the mass of particles of various sizes remaining after chewing 3 g of peanuts for 40 chewing cycles, was significantly lower after 7 days with flexible RPDs compared to conventional RPDs (acetal or PMMA RPDs).³⁴ Results were also presented for this outcome at 1 month and 3 months and remained in favour of conventional RPDs, although the authors do not present the results of statistical comparisons between groups at these time points.
- Chewing function, measured subjectively by study participants in 2 studies using different tools, showed variable results.^{31,32} The authors of 1 study reported statistically significantly better perceived chewing function based on a Chewing Function Quality questionnaire with flexible RPDs over cast metal RPDs after 3 months.³² The authors of the other study reported no statistically significant difference in satisfaction with chewing ability between flexible RPDs and either PMMA or Cr-Co RPDs (1 question with 2 response options) after 1 year.³¹

Aesthetics

Aesthetics were reported in publications of 1 parallel-group RCT,³⁵ 1 crossover RCT,³⁰ and 1 nonrandomized controlled study³¹ based on subjective outcome measures ([Table 5](#)), all with different methods of measurement. Overall, removable flexible dentures may lead to higher perceived aesthetic satisfaction compared to removable conventional dentures, but our confidence in this evidence is low.

- Patient satisfaction with appearance (or aesthetic satisfaction) was assessed in 3 studies with varied results. The authors of 1 study found no statistically significant difference in patient satisfaction between flexible and acrylic RPDs after 1 month (1 crossover RCT).³⁰ Two studies reported statistically significantly higher patient-reported aesthetic satisfaction with flexible RPDs (after 1 year³¹ and unclear follow-up³⁵) compared to conventional RPDs (PMMA or Cr-Co).
- Clinician-assessed aesthetics were significantly more likely to be rated higher for flexible RPDs compared to conventional RPDs (time point of assessment is unclear).³⁵
- One study³⁰ reported subgroup summary data and analyses based on participant age, gender, and SES; no significant differences were reported based on a P value of 0.05 or less, but the sufficiency of study power to detect such differences is not clear.

Phonetics or Speech

Phonetics or speech were reported in publications of 1 crossover RCT^{29,30} and 1 nonrandomized controlled study³¹ limited to participant-reported subjective outcome measures ([Table 6](#)). Overall, the evidence of the comparative effectiveness of removable flexible dentures compared to conventional dentures for outcomes of speech or phonetics was inconsistent across studies.

- Satisfaction with the ability to speak was not significantly different between flexible and acrylic RPDs after 1 month, measured with a VAS of 100 mm converted into 4 categories (1 crossover RCT).³⁰
- Speech defects or difficulties were reported in 1 crossover RCT²⁹ and 1 nonrandomized controlled study.³¹ The authors of 1 study found that speech difficulties were less prevalent (no significance

testing) for participants wearing flexible RPDs compared to acrylic RPDs after 1 month.²⁹ The other found speech difficulties were statistically significantly less prevalent for participants wearing flexible or Cr-Co RPDs compared to PMMA RPDs after 1 year and found no statistically significant difference between participants wearing flexible RPDs compared to Cr-Co RPDs.³¹

- The authors of 1 study³⁰ also reported summary data and analyses based on participant age, gender, and SES; no significant differences were reported based on a P value of 0.05 or less, but the sufficiency of the power of the study to detect such differences is not clear.

Denture Retention

Denture retention was reported in publications of 1 crossover RCT²⁷ and 1 nonrandomized controlled study,³¹ and included both objective and subjective outcome measures ([Table 7](#)). Both were conducted in older adult populations (mean age older than 65 years). Overall, the evidence of the effectiveness of removable flexible dentures compared to conventional dentures for objective and subjective outcomes of denture retention was inconsistent across and within studies.

- Retention, measured objectively using a pull digital force gauge, was found to be significantly lower for flexible RCDs compared to acrylic RCDs after 1 week, 1 month, and 3 months in 1 crossover RCT.²⁷
- Retention, measured subjectively using various methods, found inconsistent results. Kapur's retention score,⁴³ which was categorized, was lower (no statistical comparison) for flexible RCDs compared to acrylic RCDs after 1 week, 1 month, and 3 months in 1 study.²⁷ In the same study, participant-reported satisfaction with retention, measured with a 100 mm VAS, which was categorized, was not statistically significantly different between groups after 3 months.²⁷ Participant-reported retention, measured in 1 study by a single question (with response options of "decreased" retention or "same as before," with no definition for "before"), found significantly more participants perceiving "decreased" retention with flexible RPDs compared to those with conventional RPDs (Cr-Co or PMMA) after 1 year.³¹

Complications

Complications with dentures were reported in publications of 1 crossover RCT,^{29,30} 1 parallel-group RCT,³² and 1 nonrandomized controlled study.³¹

- The authors of 1 crossover RCT^{29,30} and 1 nonrandomized controlled study³¹ reported pain or comfort while eating ([Table 8](#)). Overall, the evidence of the effectiveness of removable flexible dentures compared to conventional dentures for comfort or pain while chewing suggests there is little or no difference between these interventions.
 - Patient-reported satisfaction with comfort while chewing was not statistically significantly different between flexible and acrylic RPDs after 1 month in 1 study.^{29,30} The authors of this study also reported the scores from the Oral Health Impact Profile (OHIP)-14 items "found it uncomfortable to eat" and "painful aching in mouth." Response groupings and results make it difficult to make inferences from this information, although there were little to no differences between these outcomes at follow-up compared to baseline. In this study, subgroup analyses were reported

based on participant age, gender, and SES; no significant differences were reported based on a P value of 0.05 or less, but the sufficiency of study power to detect such differences is not clear.

- Patient-reported pain during chewing was not statistically significantly different between flexible and conventional (Cr-Co or PMMA) RPDs after 1 year.³¹
- Manzon et al.³¹ reported other complications, all based on patient- or clinician-reported observations, comparing flexible RPDs to Cr-Co RPDs and PMMA RPDs ([Table 9](#)). The results, after 1 year, are summarized in the following bullets:
 - “Feeling of encumbrance” (not otherwise described) was significantly different across the groups and lower for flexible RPDs.
 - Prevalence of the following complications was similar between the groups: calculus on the prosthesis, plaque presence on abutment teeth, abutment teeth health, and change in occlusal position.
 - Roughness perceived by the tongue was statistically significantly different across the groups and higher for flexible RPDs.
- Survival of abutment teeth was not statistically significantly different with the use of flexible compared to conventional RPDs (Vitallium with or without surveyed bridge) at 24 months in 1 study.³²

Tissue or Periodontal Health

Outcomes associated with tissue or periodontal health were reported in the publications of 1 parallel-group RCT³⁵ and 1 nonrandomized controlled study,³¹ and included both objective and subjective outcome measures ([Table 10](#)). Overall, the evidence of the comparative effectiveness of removable flexible dentures compared to conventional dentures for outcomes of tissue and periodontal health showed similar prevalence of complications for most outcomes. However, in 1 study, it was found that mucosa redness around the abutment teeth may be statistically more likely with flexible compared to conventional RPDs.

- The prevalence of mucosa redness around the edentulous area was not statistically significantly different for flexible compared to conventional RPDs (Cr-Co or PMMA) after 1 year.³¹
- The prevalence of mucosa redness around the abutment teeth was statistically significantly different between flexible, Cr-Co, and PMMA RPDs and lowest with Cr-Co RPDs after 1 year.³¹
- Oral tissue tolerance (measured both subjectively and objectively), gingival and periodontal health (both measured using existing indices), and the need for a block in areas with undercut were “statistically on par” (as reported by authors) for flexible compared to Cr-Co RPDs after an unclear follow-up period (follow-up was reported to be 1.5 years in the study, but the timing of outcome assessment is not clear; no P values were presented).³⁵ The method of analysis poses concerns; individual patient data are provided.³⁵

Prosthesis Lifespan

Technical Complications (Prosthesis)

Technical complications related to the prostheses were reported in publications of 1 parallel-group RCT³⁵ and 1 nonrandomized controlled study,³¹ and were limited to objective outcome measures ([Table 11](#)). Overall,

the evidence of the effectiveness of removable flexible dentures compared to conventional dentures for prosthesis lifespan varied across the outcomes assessed.

- The authors of 2 studies reported the frequency of fractures of prostheses — in 1 study no fractures for flexible, Cr-Co, or PMMA-based RPDs were reported after 1 year,³¹ and in the other study no difference between frequencies of fractures in flexible RPDs and Cr-Co alloy RPDs (no statistical testing) were reported after an unclear follow-up period (in the study, follow-up to 1.5 years is reported, but the timing of the outcome assessment is not clear).³⁵
- The frequency of prosthesis discoloration and loss of artificial teeth was also assessed in 1 study,³¹ which reported no statistically significant difference in prevalence of prosthesis discoloration between flexible, Cr-Co, and PMMA-based RPDs after 1 year and a significantly higher frequency of artificial tooth loss with flexible compared to conventional RPDs after 1 year.

Life Impacts

The terms “patient satisfaction” and OHRQoL were used inconsistently across studies, and scales designed and validated to measure the latter are sometimes described as measuring satisfaction. We reported these outcomes based on the purpose of the scales or questionnaires (i.e., if an OHRQoL scale is used but is reported to measure patient satisfaction, we report this with other OHRQoL results).

Overall Satisfaction With Treatment

Overall satisfaction with prostheses was reported in publications of 1 crossover RCT^{29,30} and 1 parallel-group RCT,³⁵ limited to subjective outcome measures ([Table 12](#)). Overall, the evidence of the comparative effectiveness of removable flexible dentures compared to conventional dentures for patient satisfaction with treatment showed statistically higher patient satisfaction with flexible dentures. However, there are considerable concerns with the methodology and analysis for this outcome.

- Patient satisfaction was measured with a single-question 100 mm VAS regrouped into 4 categories in 1 study,³⁰ and with a single question with 4 response options to which numerical values were assigned in another study.³⁵ Both studies reported a statistically significantly higher overall satisfaction with the use of flexible compared to conventional RPDs (acrylic in 1 study and Cr-Co alloy with PMMA base in the other), after 1 year and unclear follow-up (follow-up to 1.5 years is reported in the study, but the timing of the outcome assessment is not clear), although the latter does not report the results of statistical analyses.

Oral Health-Related Quality of Life

OHRQoL was reported in publications of 1 crossover RCT^{29,30} and 2 parallel-group RCTs³⁵ ([Table 13](#)). Overall, the evidence of the comparative effectiveness of removable flexible dentures versus conventional dentures for overall OHRQoL is inconsistent.

- Overall OHRQoL using the OHIP-14 questionnaire was reported in 2 studies.⁴⁴⁻⁴⁶ The authors of 1 study found that, compared to baseline, OHRQoL was statistically significantly increased (decreased OHIP-14 summary scores) for both flexible and acrylic RPDs after 1 month. They did not report statistical analyses between groups but, at 1 month, 95% confidence intervals of OHIP-14 scores

overlap substantially between groups (i.e., scores are likely to be similar). The authors of another study²⁸ also reported statistically significantly increased OHRQoL between baseline and 1 year for both flexible and cast metal RPDs. They found that OHRQoL was statistically significantly higher for flexible RPDs compared to cast metal RPDs at 1 year; however, the differences between groups at follow-up range from not clinically meaningful to clinically meaningful.⁴⁷

- OHRQoL, measured with a 100 mm VAS for 12 questions derived from other tools (e.g., OHIP-49,⁴⁸ the Geriatric Oral Health Assessment Index⁴⁹), was reported to be significantly higher overall for flexible compared to conventional RPDs at the 3-month follow-up in 1 study.³²
- Domain-specific OHIP-14 scores⁴⁴⁻⁴⁶ were reported in 2 studies.^{28,29} These domains included Functional Limitation, Physical Pain, Psychological Discomfort, Physical Disability, Social Disability, and Handicap. They were assessed at 1 month in 1 study¹⁸ (compared to baseline only, with no between-group analysis), and 1 year in another study²² (comparing both within-group changes from baseline and between-group analyses at follow-up). Although the results for the domain-specific changes from baseline were inconsistent between studies, in 1 study it was reported that flexible dentures were associated with a statistically significantly increased OHIP-14 Functional Limitation score compared to cast metal RPDs at 1 year; no other significant differences were found between all other domain-specific between-group comparisons.
- The authors of 1 study²⁹ reported results for all individual questions on OHIP-14. They also presented mean OHIP-14 scores by age, gender, and SES. They compared within-group differences, noting no significant within-group differences for these factors at follow-up. Differences between groups were not assessed, but descriptive results were presented in the publication (not extracted for the current review).

Effort for Maintenance

Satisfaction or perceived experience for prosthesis cleaning was reported in publications of 1 crossover RCT^{29,30} and 1 nonrandomized controlled study³¹ ([Table 14](#)). Overall, the evidence of the comparative effectiveness of removable flexible dentures versus conventional dentures for maintenance is inconsistent.

- Satisfaction with ease of cleaning, measured using a 100 mm VAS converted to categories, was not statistically significantly different for flexible compared to acrylic RPDs after 1 month in 1 crossover RCT.^{29,30} The authors of this study also reported subgroup analyses based on participant age, gender, and SES; no significant differences were reported based on a P value of 0.05 or less, but the sufficiency of study power to detect such differences is not clear.
- The perception of difficulty with prosthesis care, measured using 1 question with 2 response options, was statistically significantly more likely to be rated as “difficult” by participants using flexible RPDs compared to those using conventional RPDs (Cr-Co or PMMA) after 1 year in 1 study.³¹

Limitations

Current Evidence and Gaps

We identified studies providing inconsistent evidence overall, and often for specific outcomes, for the relative clinical effectiveness of removable flexible dentures compared to removable conventional dentures. Limitations with the body of evidence decrease our confidence in drawing conclusions from the effects and comparisons reported.

All the studies are at some risk of bias, primarily due to the risk of performance and measurement bias. Masking participants and outcome assessors to the interventions received is difficult or not possible when comparing removable dentures because they may look and feel different. However, within the context of a clinical trial, knowing the intervention received can affect subsequent behaviours through the trial, such as frequency of denture use and cleaning, due to conscious or unconscious biases. It can also affect subjectively assessed outcomes (e.g., satisfaction and preferences), although it may be less of a concern for objectively measured outcomes (e.g., masticatory function using occlusal force metres) or, possibly, subjectively measured outcomes using validated scales (such as the OHIP-14 scale). None of the included studies masked subjects or outcome assessors to the interventions received, and subjective, nonvalidated measurement tools (or tools with unclear validity) were common. We also noted inconsistent conclusions between objective and subjective tools (e.g., for denture retention²⁷) or lack of correlation between 2 objective measures intended to measure the same outcomes (e.g., masticatory function³⁴), highlighting the need for a better understanding of the validity of measurement tools and for the use of consistent measurement tools to enable comparison between studies. Finally, most studies did not report sample size (power) calculations or minimally important differences for the main outcomes. Some studies identified no statistically significant differences between interventions but may have been underpowered to detect true differences (e.g., subgroup analyses in 1 study^{29,30}), whereas some studies identified statistically significant differences between interventions but had 95% confidence intervals that ranged from not clinically meaningful to clinically meaningful (e.g., OHRQoL in 1 study³¹).

There are gaps in the evidence for some outcomes of potential interest, long-term follow-up, reliable and transferable estimates of relative cost-effectiveness of removable flexible and conventional dentures, and evidence-based guideline recommendations. For example, no studies included in this review assessed duration or frequency of professional treatments (e.g., repairs, adjustments), and this can impact perceived satisfaction with care and perceived burden. Studies were also often limited by duration, both for assessment of some pathophysiological outcomes and relative to expected denture lifespans, with most outcomes measured after 1 year or less. Patient satisfaction and functional outcomes have been associated with length of previous denture use³⁶ and, while some studies suggest that people may adjust to new dentures within 3 months or less, others suggest that sufficiently longer (e.g., greater than 10 months) is required to accurately compare longer-term function and satisfaction.⁵⁰ Longer-term studies are also required to understand the comparative durability (e.g., retention or fractures) and acceptability (e.g., tissue health or aesthetics) of the denture base materials.³⁸ We identified no cost-effectiveness research conducted in Canada and no evidence-based clinical practice guideline recommendations for this population.

Heterogeneity

Across the 8 included studies, substantial heterogeneity in terms of the target population, the comparisons of interest, and the methods and timing of outcome assessment limited our ability to assess the consistency of the evidence within or across populations. For example, every study targeted a population with different numbers and locations, or patterns, of missing teeth (e.g., partial or complete, mandibular or maxillary jaw, Kennedy class), and this may be a factor in describing differences in conclusions across studies. Patient satisfaction, for instance, has been shown to vary across denture types by the number and location of missing teeth.³⁶ Studies also measured or analyzed outcomes in different ways, sometimes with questionable validity.

Generalizability

We identified no studies conducted in Canada, and most studies were conducted in settings with low generalizability to oral care settings in Canada, both generally or across factors that may be associated with inequity in Canada, such as place of residence, race, and socioeconomic status. While reports described the study target populations, they typically excluded participants based on health status, so these results may not be generalizable to all, including those with neurological conditions or those having received chemotherapy. All studies were also limited to adults or older adults, and these results may not represent the experiences of younger people with tooth loss. Few studies reported health equity–focused² population characteristics other than age and gender or sex. Akinyamoju et al.^{29,30} reported subgroup summary data and noted no significant differences across outcomes of satisfaction and OHRQoL by age, sex, or SES; however, this study included 30 participants and may be underpowered to detect such differences, if they exist. While the included studies were conducted in countries that are ethnically and racially diverse by the nature of their location (i.e., within Africa and Asia), the racial distributions and social and health inequalities within these countries may differ from the context in Canada. Therefore, with limited information across studies, drawing conclusions regarding how these results might reflect the experiences of diverse populations within Canada is not possible.

Other uncertainties regarding the generalizability of this evidence are the study settings and denture manufacturing practices. Studies were conducted in university hospitals or military settings in Africa, Asia, or Europe, and it is unclear how these settings and the care offered might compare to dental care in Canada, where most people receive dental care in outpatient, private clinic settings. Valplast, a thermoplastic denture that is available in Canada, was investigated in 4 studies; we were unable to confirm the availability of the other investigated interventions in Canada. The materials for comparators of interest, although not necessarily the specific manufacturers, appear similar to those available in Canada. We did not extract or compare the denture manufacturing techniques described, so we are not able to comment on how these may compare or how results might differ based on these variables.

Limitations of Our Approach

We limited our search to studies published in English for feasibility, and whether the findings from studies in other languages might influence the conclusions of our Rapid Review is unclear. We also did not compare the design and manufacturing details of dentures explored across these studies (e.g., techniques or

machines, whether any used computer-aided design) and whether these variables might impact outcomes, or the generalizability of the studies to technologies available in Canada.

We also limited the evidence summarized in this report to experimental studies for feasibility within a Rapid Review context, given the volume of available interventional trials that addressed relevant outcomes for this review. Two observational studies included in the previous CDA-AMC summary of abstracts²⁶ were therefore excluded from this review (1 reported patient satisfaction³⁷ and 1 reported multiple relevant outcomes [e.g., mastication, aesthetics, retention, comfort] with 24-month follow-up³⁸). Due to the conduct and reporting of these studies, they would be unlikely to change our conclusions. We also included 1 study for which the reporting on study group allocation methods was unclear, and although there were some indications that it was an experimental study, it is also possible that it is an observational study.³¹ Our overall assessment of the comparative effectiveness of these devices would not change if this study had been excluded, and our assessment by outcome would change for only 1 domain, “effort for maintenance.” The authors of this study reported a statistically significantly lower perceived ease of cleaning for dentures at 1 year compared to conventional dentures, whereas the authors of the other included study reported no statistically significant difference for satisfaction with ease of cleaning at 1 month between denture types. However, this study included some unique outcomes (tissue health, periodontal health, and technical complications) and longer-term follow-up for all outcomes (1 year) than other included studies. With these considerations, the inclusion of this study does not appear to drive our conclusions about the comparative effectiveness of these devices but may add perspective for longer-term follow-up and for outcomes not otherwise reported.

As the nature and scope of the request were focused on reviewing published clinical data, we did not conduct direct engagement with patients, caregivers, or providers. We also did not search for or include literature on perspectives, experiences, or other evidence that is relevant to underserved groups. Despite the inclusion of clinical studies conducted in a variety of countries with ethnic and racial diversity, sampling methods and patient characteristics were often poorly reported. With this limited scope, we have missed including the lived and living experience of individuals with disproportionate rates of tooth loss (e.g., racialized individuals living in Canada⁷) or those with inequitable access to oral health care.¹⁴ We acknowledge this as a limitation of our work, and that this Rapid Review may not highlight or identify perspectives and evidence of relevance to these underserved groups in Canada. Of note, as part of the CDA-AMC organizational commitment to reconciliation and inclusion, diversity, equity, and accessibility, we know it is important to consider and learn from First Nations, Inuit, and Métis and other diverse perspectives in our work. We also recognize that the research team consists of settler researchers, and we come to this work with our individual privileges and biases. Understanding the perspectives and priorities of First Nations, Inuit, and Métis Peoples and other underserved groups as they relate to tooth loss and prostheses can support informed health care decision-making.

Conclusions and Implications for Decision- or Policy-Making

This Rapid Review evaluated the literature regarding the clinical effectiveness and cost-effectiveness of removable partial or complete flexible dentures compared to removable partial or complete conventional dentures (e.g., acrylic or metal) for people with missing teeth, as well as guidelines related to the use of removable partial or complete flexible dentures. This report includes 8 publications of 7 RCTs^{27-30,32-35} (including 3 crossover trials^{27,29,30,34}) and 1 nonrandomized controlled study³¹ addressing question 1. We did not identify any relevant economic evaluations addressing question 2 or evidence-based clinical practice guidelines addressing question 3.

Summary of Evidence

The evidence comparing removable flexible and conventional dentures provides inconsistent support for the relative clinical effectiveness of these interventions across pathophysiological, prosthesis-related, and life impact-related outcomes. No cost-effectiveness information was identified that may be relevant to Canada. Notwithstanding the concerns about study and outcome-specific risk of bias, the included studies suggest that flexible dentures may lead to improved aesthetics and overall patient satisfaction, lower levels of denture retention (when measured objectively, but inconsistent results dependent on measurement methods), and higher rates of some complications (perceived roughness on the tongue and loss of artificial teeth); the latter were often limited to results from single studies. Studies also showed that flexible and conventional removable dentures may be comparable for speech difficulties, complications such as pain while eating, plaque on the prosthesis or abutment teeth, discoloration of the prosthesis, frequencies of fractures, change in occlusal position, and abutment survival; again, each was often limited to results from single studies. For some indices, such as masticatory function, tissue and periodontal health, overall OHRQoL, and effort for maintenance, inconsistent conclusions were reported across studies. Due to risk of bias and validity concerns, small sample sizes in many studies, and short timelines relative to expected prosthesis lifespan, substantial uncertainty exists around the strength of these findings to inform decision-making.

We also identified 1 additional systematic review⁵¹ after the literature search and screening was complete that met our eligibility criteria and was not identified in our search (not indexed in MEDLINE and published the day of our literature search). It included more interventions than those relevant to the current Rapid Review and examined a subset of outcomes. One additional study⁵² of potential relevance to this Rapid Review was included in this systematic review, of which the findings seem consistent with the current review.

We identified no cost-effectiveness studies comparing removable flexible dentures to removable conventional dentures deemed generalizable or transferable to the oral health care context in Canada. We excluded 1 economic evaluation⁴⁰ from this analysis comparing flexible RPDs to conventional RPDs that was conducted in India at 1 university-based institution. The authors of this study concluded that the cost-effectiveness of flexible dentures varies depending on the number of teeth being replaced; however, there are concerns with the validity of the estimates of clinical effect used in the analysis. A brief summary of this excluded economic evaluation can be found in Appendix 6. We identified 1 other cost-effectiveness study that was based on an RCT³⁹ included in the previous CDA-AMC summary of abstracts²⁶ but was excluded from the current Rapid Review because the flexible RPD incorporated metal elements for rests and

connectors (not clear from the abstract); these types of rigid removable thermoplastic dentures were not of interest for the current review.

We identified no evidence-based clinical practice guideline recommendations for this population that met our eligibility criteria. One position paper from Japan⁵³ does not recommend flexible non-metal-clasp dentures as definitive dentures and recommends them only in limited scenarios such as in the presence of metal allergies. Instead, they recommend flexible RPDs with metal elements or rigid thermoplastic dentures, as previously described. However, this recommendation, published in 2014, is based primarily on expert opinion, and they acknowledge the need to assess assumptions in well-designed clinical trials.

The current Rapid Review built upon a previous CDA-AMC report published in 2019. We excluded 3 studies from the previous report, 2 due to study design (observational studies)^{37,38} and 1 due to an ineligible intervention (rigid thermoplastic denture).³⁹ We also identified 3 new studies and 1 companion report for a study included in the previous review. The previous review summarized abstracts only and did not critically appraise the evidence, so comparing findings between reviews, beyond the numbers and types of studies identified, is not possible.

Considerations for Future Research

Future clinical research should ideally focus on improving key elements of design and reporting of clinical trials (e.g., CONSORT statement⁵⁴), including using randomized allocation, concealing allocation from participants before enrolment, and recording the numbers and characteristics of eligible and consenting participants compared to their source population. While edentulism is less common in younger age groups, children and adolescents may place differential value on the various outcomes; research in this population is warranted. Reports should also include study population characteristics associated with potential health inequities (e.g., place of residence, race or ethnicity, socioeconomic status),² so readers may better understand the generalizability of the results to their specific settings as well as to systemically marginalized populations. We also recommend that researchers consider employing standardized and validated outcome assessment tools to increase confidence in the results of individual studies and comparability across studies. Longer-term studies with large sample sizes are also required; the first to capture comparative durability and satisfaction across the expected denture lifespan, and the second to ensure studies are adequately powered to detect important differences, should they exist, between interventions and to enable comparisons between participant characteristics (e.g., by age, gender).

Although we did not identify a core outcome set specific to studies of removable dentures, a consensus statement (based on methodological best practices and including engagement with people with lived experience) provided a list of core outcomes for implant dentistry that is informative for the current review.⁴² Our included studies addressed many of the core outcomes included in this set (i.e., masticatory function, aesthetics, speech difficulties, denture retention, complications, tissue health, technical complications, patient satisfaction, OHRQoL, and effort for daily maintenance). However, we did not identify evidence to inform perspectives for some outcomes in this set that may be relevant to removable dentures, including duration of treatment (e.g., visits for initial denture fabrication and fitting, repairs, and adjustments) and domains of

access to care, cost-effectiveness, and level of professional competence or experience necessary to ensure a good outcome.

Finally, we identified no economic evidence conducted within Canada or from transferable cost-effectiveness studies. As patient preferences and costs may play a key role in differentiating the relative benefits and risks of these devices, and these may both be highly context specific (e.g., patient satisfaction may vary based on a number of factors³⁶ and costs will vary based on materials used and access to these materials), conducting research within populations and settings in Canada is important.

Considerations for Decision- or Policy-Making

The findings of this report suggest that flexible removable dentures may improve clinical outcomes such as aesthetics and satisfaction for adults with edentulism compared to conventional removable dentures, and they may be comparable for prosthesis-related factors such as frequency of fractures. The studies showed inconsistent results for many outcomes, including masticatory function, indices of tissue health, and OHRQoL and suggested, for some outcomes, such as retention, these devices may be inferior to removable prostheses made with acrylic or metal. However, because the current body of evidence has substantial methodological limitations, most follow-up is 1 year or less, and the relative cost-effectiveness, long-term durability, and lifespan of removable flexible compared to conventional dentures are unknown, the potential role of removable flexible dentures compared to removable conventional dentures for edentulism remains to be clearly defined. We identified no economic evidence generalizable or transferable to Canada to inform a decision based on cost-effectiveness, and this is important for future research.

Therefore, deciding which devices might be best may require a better understanding of the relative value of these outcomes to patients, clinicians, and payers. Both cost and clinical effectiveness determine the optimal choice in specific clinical scenarios and patient needs. From a clinician's perspective, outcomes such as relative function, durability, and rates of oral health complications (e.g., to tissues, teeth, or prostheses) may be priorities. However, patient choice and access to care typically influence tooth replacement. From a patient perspective, key factors may include aspects of the design, look, long-term maintenance, costs or insurance coverage, and experience with their prosthesis. Important drivers may include lifestyle, social factors, allergies, expectations, available options, and budget; for some, appearance may surpass function in terms of importance.¹⁷ Age, gender, and the number or location of missing teeth have also been shown to impact OHRQoL and patient satisfaction scores.^{36,40}

Decision-makers considering these interventions may also wish to reflect on other factors, including barriers and potential solutions to barriers to achieving equitable access to oral health care in Canada. This may include equitable access to qualified professionals and equipment and access to oral health services or coverage across insurance plans.¹⁴ In Canada, dentures may be paid for by patients, private insurance, or public insurance such as the Canadian Dental Care Plan⁵⁵ and the Non-Insured Health Benefits program for First Nations and Inuit.⁵⁶ Differences in coverage, or access to coverage, for removable dentures and eligibility criteria for frequency of replacements could affect health and social outcomes, potentially disproportionately affecting vulnerable groups.

Finally, many current advancements in denture manufacturing, such as more advanced thermoplastics, 3D printing technology, and digital dentistry, may impact outcomes; for example, computer-aided design and manufacturing may create precise dentures with superior function and comfort. These variables will be important to consider in future primary research and evidence summaries.

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Appendix 1: Detailed Methods and Selection of Included Studies

Please note that this appendix has not been copy-edited.

What Is a Rapid Review?

Rapid reviews are based on accelerated and abbreviated systematic review methods, balancing timeliness with rigour, to allow for timely decision-making. Due to these abbreviated methods, rapid reviews have some limitations. For example, our electronic literature search was limited to studies published from 2019 to present, and older studies were identified from a previous CDA-AMC (formerly CADTH) review.²⁶ We attempted to mitigate this potential limitation by searching for and including relevant systematic reviews published in the past 5 years to identify other relevant studies, 1 of which³⁶ was identified through this process. Focusing on more recently published articles may also be more reflective of current practices. Finally, screening, critical appraisal, and data extraction were conducted by 1 reviewer.

Literature Search Methods

The literature search strategy used in this report is an update of 1 developed for a previous CDA-AMC (formerly CADTH) report.²⁶ For the current report, an information specialist conducted a literature search on key resources including MEDLINE, the Cochrane Database of Systematic Reviews, the International HTA Database, the websites of health technology assessment agencies in Canada and major international HTA agencies, as well as a focused internet search. The search approach was customized to retrieve a limited set of results, balancing comprehensiveness with relevance. The initial search was limited to English-language documents published between January 1, 2009 and August 29, 2019. For the current report, database searches were rerun on August 1, 2025 to capture any articles published or made available since the initial search date. The search of major HTA agencies was also updated to include documents published since January 2019.

Selection Criteria and Methods

One reviewer screened citations and selected studies. Titles and abstracts were reviewed, and potentially relevant articles were retrieved and assessed for inclusion. As an update to a previous CDA-AMC (formerly CADTH) report, articles were screened for eligibility if they were published and indexed over the current search period or were included in the 2019 CDA-AMC report.²⁶ In addition, we identified 1 eligible systematic review³⁶ from the current search that had broader eligibility criteria than, but focused on only 1 outcome domain of relevance (patient satisfaction) to, the current review. Given that some of the included studies included other outcomes of relevance to our review, it was deemed important to review the primary study records to capture additional relevant outcomes. Therefore, this systematic review was excluded from the current review, and its included studies were screened for relevance; most of those of relevance to the current Rapid Review were previously identified in the 2019 report, and we included 1 additional study.³²

Economic studies conducted in health care systems outside of Canada were not eligible for this review due to their uncertain or limited transferability to Canada. In the absence of economic studies conducted in health care systems within Canada, economic studies conducted outside of Canada are provided in [Appendix 6](#) and briefly discussed.

The final selection of full-text articles was based on the inclusion criteria presented in [Table 1](#).

Exclusion Criteria

Articles were excluded for the following reasons:

- did not meet the selection criteria outlined in [Table 1](#)
- were duplicate publications or were published before 2019, unless included in the previous CDA-AMC (formerly CADTH) report²⁶ or a relevant systematic review
- were systematic reviews in which all relevant studies were captured in other more recent or more comprehensive systematic reviews
- were primary studies captured in 1 or more included systematic reviews, unless the systematic review was deemed to provide insufficient information (e.g., limited outcomes)
- were in vitro studies, simulation or lab-based studies, case reports, or case series
- were guidelines with unclear methodology
- economic studies conducted in health care systems outside of Canada.

Critical Appraisal of Individual Studies

The included publications were critically appraised by 1 reviewer using the Downs and Black checklist⁵⁷ for randomized and nonrandomized studies. Summary scores were not calculated for the included studies; rather, the strengths and limitations of each included publication were described narratively.

Data Extraction

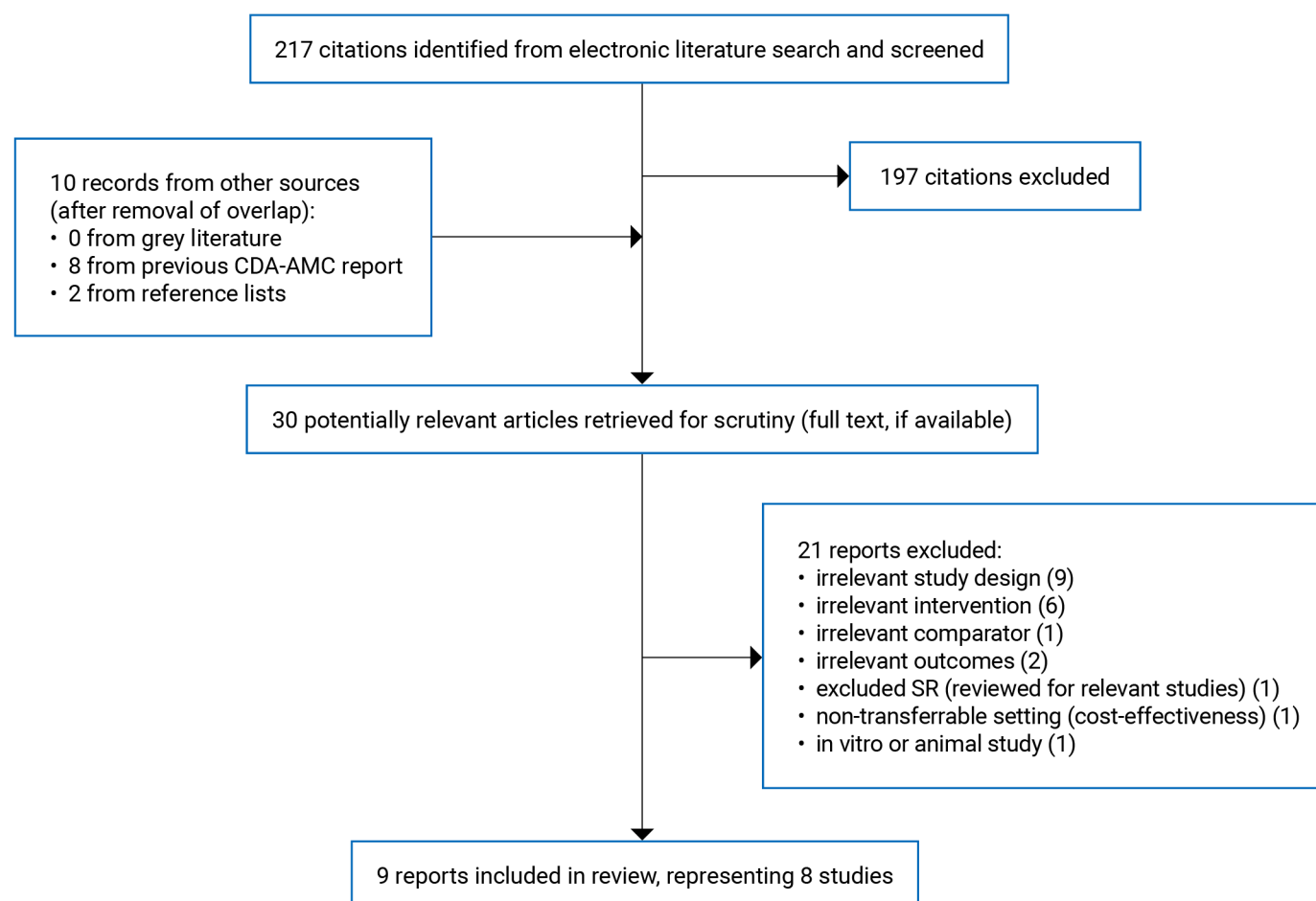
One reviewer extracted data directly into tables created in Microsoft Word, modifying them as necessary. The extracted information included study characteristics, methodology (e.g., study design), and characteristics of the population (including information on factors associated with health equity), intervention, comparator, and results regarding the outcomes of interest. Details are reported in [Appendix 3](#). The PROGRESS-Plus² framework guided equity considerations and includes place of residence, race (or ethnicity, culture), occupation, gender or sex, religion, education, SES, and social capital. These characteristics are discussed across the evidence, when available.

When reporting on sex, gender, race, or ethnicity in this Rapid Review, we retained the language used by the original study authors, and, whenever possible, we referred to these groups based on guidance from the CDA-AMC style guide⁵⁸ at the time of this Rapid Review, with an understanding that language is constantly evolving.

Appendix 2: Selection of Included Studies

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Figure 1: Selection of Included Studies



CDA-AMC = Canada's Drug Agency; SR = systematic review.

Appendix 3: Characteristics of Included Publications

Please note that this appendix has not been copy-edited.

Table 2: Characteristics of Included Primary Clinical Studies

Study citation, country, funding source	Study design and setting	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
Olawale et al. (2022)²⁷ Country: Nigeria Funding source: NR	Crossover RCT; additional details, including the number of centres, were not specified Consecutive individuals consenting to participate Recruitment and treatment between March 2019 and February 2020	Summary eligibility criteria: Patients with complete edentulous maxillary arch for at least 6 months, any dentition on lower arch Exclusions: Bruxism, previous chemotherapy or radiotherapy, allergy to acrylic resin, abnormal tongue movement or size, xerostomia or excessive salivation, unfavourable ridge undercut Number of participants: 10 Age (years), mean (SD): 66.5 (9.7); 80% 60 years and older Sex or gender: 50% female, 50% male Cause of edentulism: NR Missing teeth: 100% completely edentulous upper jaw (eligibility); 70% completely edentulous lower jaw; 30% partial edentulous lower jaw Other PROGRESS-Plus criteria: NR^a	Intervention: Flexite plus (thermoplastic acrylic) RCD (n = 10) Comparator: Acrylic RCD (pink shade, heat cure acrylic resin, company NR) (n = 10) Other select details: Identical cast was made for each denture and data collected by 1 researcher	Relevant outcomes: • Denture retention (subjective and objective) • Satisfaction with denture retention Follow-up: Up to 3 months after using each denture
Kumar et al. (2021)²⁸ Country: India Funding source: Authors reported that no specific funding	A single-centre, prospective, concurrent, parallel-arm RCT Prosthodontics, tertiary care, metropolitan city Patients were recruited between	Summary eligibility criteria: Aged 30 to 70 years, with Kennedy Class I, partially edentulous mandibular arch, completely dentate maxillary arch. No previous denture	Intervention: Thermoplastic polyacetyl based flexible RPD (company NR) (n = 11) Comparator: Cast metal RPD (company NR) (n = 11) Other select details: All	Relevant outcomes: • Patient satisfaction/ OHRQoL^b Follow-up: 1 year

Study citation, country, funding source	Study design and setting	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
was received for this research	December 2016 to October 2017	use, healthy mucosa and periodontal status. Exclusions: Systemic medical conditions and previous denture use Number of participants: 22 Age (years), mean (SD): Intervention: 42.92 (8.15) Comparator: 42.50 (7.49) Sex or gender: 54.54% females and 45.45% males; authors reported as "gender" Cause of edentulism: NR Missing teeth: Refer to eligibility, no other details reported Other PROGRESS-Plus criteria: NR^a	patients were treated by the same single operator	
Akinyamoju et al. (2019)²⁹ and Akinyamoju et al. (2017)³⁰ Country: Nigeria Funding source: Authors reported that no specific funding was received for this research	Single-centre crossover RCT Prosthetics clinic at a tertiary university hospital Patients were recruited between November 2014 and April 2015	Summary eligibility criteria: age ≥ 16 years, with 1 to 3 missing teeth in the anterior region of the maxillary or mandibular arch (Kennedy class IV and anterior class III edentulous spaces) for at least 3 months, good periodontal health or mild periodontal disease, mild to moderate Seibert's classes I and II edentulous ridge, no previous denture use. Number of participants: 32 recruited, 2 lost to follow-up after delivery of the initial denture (1 flexible, 1 acrylic), 30 analyzed Age (years), mean (SD): 33.8 (10.01), range: 16 to 51	Intervention: Valplast flexible RPD (Dentiflex-Roko) (n = 30) Comparator: All-acrylic RPD (Trevalon) (n = 30) Other select details: All laboratory procedures were done by 1 dental technologist. Oral prophylaxis was done for all patients before denture fitting was complete. Postinsertion instructions were given to patients in oral and written forms.	Relevant outcomes: - Participant satisfaction, overall and domain-specific³⁰ - OHRQoL scores (OHIP-14), overall and domain-specific²⁹ Follow-up: up to 1 month of denture use

Study citation, country, funding source	Study design and setting	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
		Sex or gender: 50% reported as male (sex); other sexes or genders NR Cause of edentulism: 90% trauma (e.g., road traffic accident, falls, assault, sports); 10% periodontal disease Missing teeth: All patients were partially dentate, and 91% were replacing maxillary teeth. The mean (SD) duration of edentulism was 11.37 (10.52) years Race or ethnicity (Tribe): 90% Yoruba, 6.7% Igbo, 3.3% Ibibio Place of residence: 90% urban, 10% suburban SES: Reported as 60% lower class; 30% lower middle class; 10% upper middle class Education: 6.7% completed up to primary school; 33.3% completed up to secondary school; 16.7% completed postsecondary (technical); 43.3% completed tertiary Marital status: 56.7% married, 43.3% single Other PROGRESS-Plus criteria: NR^a		
Manzon et al. (2019)³¹ Country: Not stated; author affiliation is in Italy Funding source: NR	Nonrandomized controlled study, allocation method unclear^c; details regarding the number of centres and recruitment dates were not reported	Summary eligibility criteria: ≥ 65 years, requiring removable partial dentures of maxillary arch, missing no more than 4 contiguous teeth and alveolar bone retraction < 4.5 mm as measured by OPT	Intervention: - Valplast flexible RPD (Nylon 12, Valplast International Corp.) (n = 40) Comparators: - Cr-Co alloy RPD (Wisil Alloy, Co 64% Cr 28.65%, DeguDent GmbH) (n = 40)	Relevant outcomes: - Chewing ability - Aesthetics (satisfaction) - Speech difficulty - Denture retention - Discomfort or pain during mastication - Roughness perceived

Study citation, country, funding source	Study design and setting	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
		Exclusion: Poor oral hygiene, periodontitis, dental mobility, diabetes, ongoing chemotherapy Number of participants: 120 Age (years), mean (range): 73 (65 to 84) Sex or gender: 60% were female and 40% were male (sex or gender not specified) Cause of edentulism: NR Missing teeth: Refer to eligibility, no other details reported Other PROGRESS-Plus criteria: NR^a	• Transitory heat polymerized PMMA resin RPD (SINTODENT S.r.l.) (n = 40) Other select details: Patients received detailed information as recommended by manufacturers. Patients with Valplast RPD were advised to only brush manually with a soft brush. Patients with Cr-Co RPD were furnished with a denture brush and nonabrasive paste.	by the tongue • Feeling of encumbrance • Tissue health • Health of abutment teeth • Change in occlusal position • Presence of temporomandibular disorders • Technical complications (fractures of prosthesis, discoloration of prosthesis, loss of artificial teeth) • Calculus on prosthesis • Ease of cleaning Follow-up: 1 year
Sadek and Elawady (2019)³² Country: Egypt Funding source: Authors reported that no specific funding was received for this research	Single-centre parallel-group randomized study Outpatient clinic of a removable prosthodontics university department Details regarding recruitment dates were not reported	Summary eligibility criteria: Kennedy Class II modification 1, partially edentulous mandible, opposing maxillary teeth, periodontally healthy remaining teeth, “medically free” Number of participants: 42 Age (years), range: 45 to 60 Sex or gender: NR Cause of edentulism: NR Missing teeth: Refer to eligibility, no other detail reported Other PROGRESS-Plus criteria: NR^a	Intervention: • Thermopress RPD (company NR) (n = 14) Comparators: • Vitallium RPD (company NR) (n = 14) • Vitallium RPD with surveyed bridge restoring the modification area (company NR) • (n = 14) Other select details: Participants were instructed to maintain proper denture hygiene: remove dentures for sleeping hours, keep it in tap water, clean the dentures after each meal under tap water only, not to use any mouthwashes or denture cleansers during the study period and not to use any denture adhesives	Relevant outcomes: • Chewing function quality • Survival rate of abutment teeth • Overall patient satisfaction • OHRQoL Follow-up: Up to 24 months; most data collection at 3 months

Study citation, country, funding source	Study design and setting	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
Fayad et al. (2018)³³ Country: Saudi Arabia Funding source: Authors reported that no specific funding was received for this research	Single-centre, prospective, parallel-arm randomized trial Outpatient clinic, university Recruitment between June 2016 to June 2017	Summary eligibility criteria: Completely edentulous patients, no psychiatric disease or movement disorders Number of participants: 100 Age (years), mean: 52 Sex or gender: NR Cause of edentulism: NR Missing teeth: Refer to eligibility, no other details reported Other PROGRESS-Plus criteria: NR^a	Intervention: Vertex ThermoSens thermoplastic RCD (Vertex-Dental B.V.) (n = 50) Comparator: Conventional heat-cured acrylic RCD (Vertex Regular, Vertex-Dental B.V.) (n = 50) Other select information: NR	Relevant outcomes: Maximum bite force Follow-up: 6 months
Macura-Karbownik et al. (2016)³⁴ Country: Not stated; all authors cite affiliations from Poland Funding source: NR	Randomized, crossover study; 3 dentures were tested in all patients Other details, including the number of centres and dates of recruitment, were NR	Summary eligibility criteria: Patients with unilateral or bilateral loss of 3 to 6 teeth from 1 dental arch (Kennedy class III) and natural teeth in the opposing dental arch, at least 2 years since the last episode of tooth loss, no pain or temporomandibular abnormalities Number of participants: 30 Age (years), mean (range): 49.6 (35 to 60 years) Sex or gender: 12 men and 18 women; NR how sex or gender was defined Cause of edentulism: NR Missing teeth: 16 patients with bilateral teeth loss, 14 with unilateral teeth loss Other PROGRESS-Plus criteria: NR^a	Intervention: - Polyamide RPD (Valplast) (n = 30) Comparators: - RPD with acetal-made framework and clasps and PMMA base and teeth (TSM Acetal Dental; Pressing Dental) (n = 30); - PMMA-RPD (Villacryl H Plus; Zhermack) (n = 30) Other select details: NR	Relevant outcomes: - Chewing efficiency - Occlusal force Follow-up: 90 days

Study citation, country, funding source	Study design and setting	Population characteristics	Intervention and comparator(s)	Clinical outcomes, length of follow-up
Hundal and Madan (2015) ³⁵ Country: India Funding source: NR	Single-centre parallel-group RCT Outpatient department of a military dental centre Participants were randomly selected from those who reported to the centre. Dates of recruitment were not reported.	Summary eligibility criteria: Kennedy Applegate class II partially edentulous, medically fit with average oral health status Number of participants: 30 Age (years), range: 25 to 45 years Sex or gender: NR Cause of edentulism: NR Missing teeth: NR SES: Patients were reported to be from middle-income group or socioeconomic strata Other PROGRESS-Plus criteria: NR ^a	Intervention: Valplast flexible RPD made of nylon-based super polyamide resin (n = 15) Comparator: conventional cast Cr-Co alloy (clasps with occlusal rests) and PMMA denture base RPD (ProBase Hot, Ivoclar Vivadent) (n = 15) Other select details: NR	Relevant outcomes: • Aesthetics • Oral soft tissue tolerance • Gingivitis • Periodontal health • Adaptability in areas with undercut • Frequency of fracture or repair • Overall patient satisfaction Follow-up: 1.5 years, outcome measurement timing is unclear

Cr-Co = chromium-cobalt; NR = not reported; OHIP-14 = Oral Health Impact Profile-14; OHRQoL = Oral Health-Related Quality of Life; OPT = orthopantomography; PMMA = polymethyl methacrylate; RCD = removable complete denture; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation; SES = socioeconomic status.

^aThe main PROGRESS-Plus criteria include place of residence, race, ethnicity, culture, language, occupation, gender, sex, religion, education, SES, social capital, personal characteristics associated with discrimination (e.g., age, disability), features of relationships, and time-dependent relationships.²

^bThis study stated they measured patient satisfaction but used a tool typically described to measure OHRQoL (Oral Health Impact Profile-14).

^cThis study was included although there is uncertainty regarding its study design due to lack of clear reporting on study group allocation methods and may be an observational study.

Appendix 4: Critical Appraisal of Included Publications

Please note that this appendix has not been copy-edited.

Table 3: Clinical Effectiveness of Flexible Dentures: Strengths and Limitations of Clinical Studies Using the Downs and Black Checklist⁵⁷

Strengths	Limitations
Olawale et al. (2022)²⁷	
• The main objectives of the study, main outcomes, characteristics of the participants, distribution of principal confounders between groups, and main findings (including P values) are clearly described • The details of the intervention of interest are not described in the report, but references are provided • The report provides estimates of the random variability in the data for the main outcome • The authors state they recruited consecutive patients over a set period of time for both groups, and those asked to participate should be representative of the population from which they were recruited • The length of follow-up was similar between study arms • The statistical tests used to assess the main outcomes appear appropriate • The study subjects were randomized to intervention groups (ballot box with 2 options)	• The authors do not mention losses to follow-up • AEs were not reported (not focus of study) • It is unclear if those subjects who agreed to participate were representative of the population from which they were recruited; numbers and characteristics of those declining consent are not reported • It is unclear if the staff, places, and facilities where the participants were treated were representative of the treatment most patients would receive • It is unclear if the randomized intervention assignment was concealed from both patients and health care staff until recruitment was complete and irrevocable – as described, the method of allocation could be circumvented – however, this is a crossover trial with no reported losses to follow-up, so this may be less of a concern • No attempt was made to mask participants or outcome assessors to the interventions received, and (for subjective outcomes in particular) this may have influenced study outcomes • It is unclear if any results or analyses were ad hoc (i.e., not prespecified) because no trial registration or protocol is referenced • It is unclear if adherence with the interventions was reliable (no mention of cleaning, use, and so forth) • It is unclear if the main outcome measures used were accurate (valid and reliable) – 1 is referenced, 1 was validated with 2 people while 1 seems objective • No sample size calculation or reference to a clinically meaningful difference is presented for the main outcome(s) and the study has 10 participants; it is unclear if the study had sufficient power to detect a clinically important effect • The authors do not report if they have any conflicts of interest • The authors do not report if the study was funded or the source of funding
Kumar et al. (2021)²⁸	
• The main objectives of the study, main outcomes, characteristics of the participants, distribution of principal confounders between groups and main findings (including P values) are clearly described • The details of the intervention are somewhat clearly	• The report does not include information regarding the number of individuals that were assessed for eligibility over the recruitment period or mention consecutive patients and thus it is unclear if those asked to participate in the study were representative of the population from which they were recruited

Strengths	Limitations
described • The authors report that there were no losses to follow-up (including due to harms) • The length of follow-up was similar between study arms • The statistical tests used to assess the main outcomes appear appropriate • The main outcome measures relevant to this review appear valid and reliable • The participants across study groups were recruited from the same population over the same time period • Study subjects were randomized to intervention groups (computer-generated blocked randomization table) • The randomized intervention assignment was concealed from both participants and health care staff until recruitment was complete (sequentially numbered, sealed opaque envelopes) • There was no adjustment for confounding but, for the variables they reported, baseline characteristics were similar • The authors declare that no funding was received for the study	• It is unclear if those subjects who agreed to participate were representative of the population from which they were recruited; numbers and characteristics of those declining consent are not reported • It is unclear if the staff, places, and facilities where the participants were treated were representative of the treatment most patients receive • No attempt was made to mask participants or outcome assessors to the interventions received, and this may have influenced study outcomes • It is unclear if any results or analyses were ad hoc (i.e., not prespecified) as no trial registration or protocol is referenced • It is unclear if adherence with the interventions was reliable (no mention of cleaning, use, and so forth) • No sample size calculation or reference to a clinically meaningful difference is presented for the main outcome(s) and the study has 22 participants; it is unclear if the study had sufficient power to detect a clinically important effect • The authors do not report if they have any conflicts of interest
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰	
• The main objectives of the study, main outcomes, characteristics of the participants, interventions, distributions of principal confounders between groups, main findings including estimates of random variability, and P values are clearly described • The characteristics of participants lost to follow-up have not been described but there were few and they are unlikely to impact the conclusions • The sample was described as consecutive, and the subjects should be representative of the population from which they were recruited • Both groups were derived from the same population over the same time period • The length of follow-up was similar between study arms or adjusted for in the analysis • The main outcome measures relevant to this review appear valid and reliable • The study subjects were randomized to intervention groups (jar with numbered ballots, 2 options) • The authors report they have no conflicts of interest associated with this study • The authors declare that no funding was received for the study	• This study is not focused on AEs and none are reported • It is unclear if those subjects who agreed to participate were representative of the population from which they were recruited; numbers and characteristics of those declining consent are not reported • It is unclear if the staff, places, and facilities where the participants were treated were representative of the treatment most patients would receive • No attempt was made to mask participants or outcome assessors to the interventions received, and this may have influenced study outcomes, which are primarily patient-reported • It is unclear if any results or analyses were ad hoc (i.e., not prespecified) because no trial registration or protocol is referenced • It is unclear if adherence with the interventions was reliable (no mention of cleaning, use, and so forth) • It is unclear if the randomized intervention assignment was concealed from both patients and health care staff until recruitment was complete and irrevocable – as described, the method of allocation could be circumvented – however, this is a crossover trial with no reported losses to follow-up so this may be less of a concern • The authors reported conducting a sample size calculation but do not present the difference they were powered to detect and it is unclear if the study had sufficient power to detect a clinically important effect for all main outcomes

Strengths	Limitations
	• The statistical analysis does not adjust for multiplicity although many statistical tests are presented
Manzon et al. (2019)³¹	
• The main objectives of the study, main outcomes, characteristics of the participants, interventions of interest, distribution of principal confounders between groups, main findings, important AEs, and P values have been described • The length of follow-up was similar between study arms • The participants across study groups seem to have been recruited from the same population over the same period of time	• The report does not provide estimates of the random variability in the data for the main outcomes • The authors do not mention losses to follow-up • It is unclear if the subjects asked to participate in the study or those who agreed to participate were representative of the population from which they were recruited (no mention of consecutive participants, those who declined consent, and so forth) • It is unclear if the staff, places, and facilities where the participants were treated were representative of the treatment most patients receive • No attempt was made to mask participants or outcome assessors to the interventions received, and this may have influenced study outcomes • It is unclear if any results or analyses were ad hoc (i.e., not prespecified) as no trial registration or protocol is referenced • It is unclear if adherence with the interventions was reliable (no mention of cleaning, use, and so forth) • It is unclear if the main outcome measures used were valid and reliable – they were based on single questions with no clear assessment for validity • The report does not mention how participants were allocated to intervention groups or whether intervention assignment was concealed from participants and staff before enrolment • There was no adjustment for confounding • No sample size calculation or reference to a clinically meaningful difference is presented for the main outcome(s) and no primary outcome is stated; it is unclear if the study had sufficient power to detect a clinically important effect, although significant differences were observed between groups in the distribution of categorical responses for some outcomes • The authors do not report if they have any conflicts of interest • The authors do not report if the study was funded or the source of funding
Sadek and Elawady (2019)³²	
• The main objectives of the study, main outcomes, characteristics of the participants, interventions of interest, and main findings including P values are clearly described • The length of follow-up was similar between study arms or adjusted for in the analysis • The participants across study groups were recruited from the same population over the same period of time • The authors report they have no conflicts of interest associated with this study	• The distributions of principal confounders in each group of subjects to be compared are not clearly described • The report does not provide estimates of the random variability in the data for the main outcomes • Some important AEs that may be a consequence of the intervention have not been reported • The authors do not mention losses to follow-up • P values have not been reported for the main outcomes • It is unclear if the subjects asked to participate in the study

Strengths	Limitations
The authors declare that no funding was received for the study	or those who agreed to participate were representative of the population from which they were recruited; numbers and characteristics of those declining consent are not reported - It is unclear if the staff, places, and facilities where the participants were treated were representative of the treatment most patients receive - No attempt was made to mask participants or outcome assessors to the interventions received, and this may have influenced subjective study outcomes - It is unclear if any results or analyses were ad hoc (i.e., not prespecified) as no trial registration or protocol is referenced - It is unclear if adherence with the interventions was reliable (no mention of cleaning, use, and so forth) - It is unclear if the main outcome measures used were valid and reliable - the questions posed to participants included selected questions from validated scales - The reports states that study subjects were randomized to intervention groups, but no method of randomization is described nor methods to conceal allocation - No sample size calculation or reference to a clinically meaningful difference is presented for the main outcome(s); it is unclear if the study had sufficient power to detect a clinically important effect
Fayad et al. (2018) ³³	
- The main objectives of the study, main outcomes, and main findings, including estimates of random variability, and P values have been clearly described - The length of follow-up was similar between study arms - The statistical tests used to assess the main outcomes appear appropriate - The main outcome measures relevant to this review appear valid and reliable - No attempt was made to mask participants or outcome assessors to the interventions received; however, it is unlikely that this would impact the results of the study due to the types of outcomes measured, which appear to be objective - The authors report they have no conflicts of interest associated with this study - The authors declare that no funding was received for the study	- The following are not clearly described: characteristics of the participants included in the study, the interventions of interest, the distributions of principal confounders in each group, important AEs, losses to follow-up - It is unclear if those asked to participate in the study were representative of the population from which they were recruited — the report states including “randomly selected 100 completely edentulous patients” but does not describe method of selection - It is unclear if those who were prepared to participate were representative of the entire population from which they were recruited; numbers and characteristics of those declining consent are not reported - It is unclear if the staff, places, and facilities where the participants were treated were representative of the treatment most patients receive - It is unclear if any results or analyses were ad hoc (i.e., not prespecified) as no trial registration or protocol is referenced - It is unclear if adherence with the interventions was reliable (no mention of cleaning, use, and so forth) - The report states that participants were randomly allocated to treatment groups but includes no description of the method of generation of the randomization sequence - It is unclear if the randomized intervention assignment was concealed from both patients and health care staff until

Strengths	Limitations
	recruitment was complete • There was no adjustment for potential confounding • The authors state a power calculation was conducted but do not provide the minimum effect difference they are powered to detect or whether this difference is clinically meaningful
Macura-Karbownik et al. (2016)³⁴	
• The main objectives of the study, main outcomes, characteristics of the participants, interventions of interest, distribution of principal confounders between groups, and the main findings, including the random variability in the data and P values, have been clearly or somewhat clearly described • The length of follow-up was similar between study arms • The main outcome measures relevant to this Rapid Review appear valid and reliable • The participants across study groups were recruited from the same population over the same time period • The statistical analysis adjusts for multiplicity	• The publication does not report AEs • The authors do not mention losses to follow-up • It is unclear if those asked to participate in the study were representative of the population from which they were recruited — no description of the target population is provided • It is unclear if those who were prepared to participate were representative of the entire population from which they were recruited — unclear if consent was sought • It is unclear if the staff, places, and facilities where the participants were treated were representative of the treatment most patients receive • No attempt was made to mask participants or outcome assessors to the interventions received, and this may have influenced study outcomes • It is unclear if any results or analyses were ad hoc (i.e., not prespecified) as no trial registration or protocol is referenced • It is unclear if adherence with the interventions was reliable (no mention of cleaning, use, and so forth) • Study subjects were randomized to intervention groups (a random sequence of the denture manufacturing and insertion) but no other details are provided • It is unclear if the randomized intervention assignment was concealed from both patients and health care staff until recruitment was complete • No sample size calculation or reference to a clinically meaningful difference is presented for the main outcome(s); it is unclear if the study had sufficient power to detect a clinically important effect • The authors do not report if they have any conflicts of interest • The authors do not report if the study was funded or the source of funding
Hundal and Madan (2015)³⁵	
• The main objectives of the study, main outcomes, characteristics of the participants, interventions of interest, the main findings including the random variability in the data, and some AEs have been clearly described • The participants across study groups appear to be recruited from the same population, same centre, although unclear process of selection and allocation • The authors report they have no conflicts of interest associated with this study	• The following was not clearly described: the distributions of principal confounders in each group (only overall provided for key variables), losses to follow-up, P values for the main outcomes (descriptive study with no statistical analysis) • It is unclear if the subjects asked to participate in the study were representative of the entire population from which they were recruited — the authors stated recruiting a random selection of individuals (meeting specific criteria) who presented at their centre with no details on selection method • It is unclear if those subjects who were prepared to participate

Strengths	Limitations
	were representative of the entire population from which they were recruited; numbers and characteristics of those declining consent are not reported • It is unclear if the staff, places, and facilities where the participants were treated were representative of the treatment most patients receive — this study was conducted at a military dental centre • No attempt was made to mask participants or outcome assessors to the interventions received, and this may have influenced study outcomes • It is unclear if any results or analyses were ad hoc (i.e., not prespecified) as no trial registration or protocol is referenced • It is unclear if length of follow-up was similar between study arms — the authors state that follow-up was for 1.5 years and the periodicity of recall was 24 hours, 1 month, 3 months, and 6 months after insertion of the prosthesis. It is not clear when these outcomes were measured or whether the average follow-up time was the same between study arms • It is unclear if adherence with the interventions was reliable (no mention of cleaning, use, and so forth) • It is unclear if the main outcome measures used were valid and reliable • It is unclear if participants in different study groups were recruited over the same period of time — the report does not mention the recruitment period • Study subjects were randomized to intervention groups but no other details are provided • It is unclear if the randomized intervention assignment was concealed from both patients and health care staff until recruitment was complete • No sample size calculation or reference to a clinically meaningful difference is presented for the main outcome(s); it is unclear if the study had sufficient power to detect a clinically important effect • The authors do not report if the study was funded or the source of funding

AE = adverse event.

Appendix 5: Main Study Findings

Please note that this appendix has not been copy-edited.

Table 4: Summary of Findings by Outcome — Masticatory Function

Citation and study design Outcome name and measurement method	Time points	Intervention groups and number of participants (n)	Outcome result	Within-group difference from baseline (P value)	Between-group difference (P value)
Follow-up: Up to 3 months					
Sadek and Elawady (2019) ³² Parallel-group RCT Outcome: Chewing Function Measurement: Chewing Function Quality questionnaire ^a (lower is better)	Baseline and 3-month follow-up	Thermopress RPD (n = 14)	Results shared in figures and not extracted – groups similar at baseline	NR	One-way ANOVA, Tukey's post hoc test: Thermopress significantly lower than other groups (P value < 0.05)
		Vitallium RPD (n = 14)		NR	
		Vitallium RPD with surveyed bridge (n = 14)		NR	
Macura-Karbownik et al. (2016) ³⁴ RCT-CO Outcome: Chewing efficiency Measurement: Chewing efficiency coefficient ^b	Baseline ^c	Total sample – without denture (n = 30)	Median (IQR): 0.77 (0.12) Range: 0.63 to 0.97	NA	NR
	7 days	Valplast polyamide RPDs (n = 30)	Median (IQR): 0.79 (0.06) Range: 0.69 to 0.95	P = 1.000	Flexible vs. acetal: P < 0.001 Flexible vs. PMMA: P < 0.001 PMMA vs. acetal: P = 0.005
		Acetal RPDs ^d (n = 30)	Median (IQR): 0.89 (0.06) Range: 0.81 to 1.09	P < 0.001	
		PMMA RPDs (n = 30)	Median (IQR): 1.02 (0.13)	P < 0.001	

Citation and study design Outcome name and measurement method	Time points	Intervention groups and number of participants (n)	Outcome result	Within-group difference from baseline (P value)	Between-group difference (P value)
			Range: 0.90 to 1.29		
	1 month	Valplast polyamide RPDs (n = 30)	Median (IQR): 0.81 (0.09) Range: 0.73 to 0.96	NR	NR
		Acetal RPDs ^d (n = 30)	Median (IQR): 0.94 (0.11) Range: 0.82 to 1.15	NR	
		PMMA RPDs (n = 30)	Median (IQR): 1.07 (0.17) Range: 0.93 to 1.32	NR	
	3 months	Valplast polyamide RPDs (n = 30)	Median (IQR): 0.80 (0.11) Range: 0.68 to 0.96	NR	NR
		Acetal RPDs ^d (n = 30)	Median (IQR): 0.93 (0.13) Range: 0.77 to 1.16	NR	
		PMMA RPDs (n = 30)	Median (IQR): 1.10 (0.17) Range: 0.87 to 1.34	NR	
	Baseline ^e	Valplast polyamide RPDs (n = 30)	Median (IQR): 48 (44) Range: 10 to 220	NA	NR
		Acetal RPDs ^d (n = 30)	Median (IQR): 81 (59) Range: 29 to 263	NA	
		PMMA RPDs (n = 30)	Median (IQR): 100 (71) Range: 38 to 272	NA	

Citation and study design Outcome name and measurement method	Time points	Intervention groups and number of participants (n)	Outcome result	Within-group difference from baseline (P value)	Between-group difference (P value)
	7 days	Valplast polyamide RPDs (n = 30)	Median (IQR): 50 (47) Range: 10 to 208	NR	NR
		Acetal RPDs ^d (n = 30)	Median (IQR): 81 (64) Range: 30 to 260	NR	
		PMMA RPDs (n = 30)	Median (IQR): 90 (83) Range: 38 to 250	NR	
	1 month	Valplast polyamide RPDs (n = 30)	Median (IQR): 48 (50) Range: 10 to 220	NR	NR
		Acetal RPDs ^d (n = 30)	Median (IQR): 85 (59) Range: 34 to 263	NR	
		PMMA RPDs (n = 30)	Median (IQR): 106 (71) Range: 50 to 269	NR	
	3 months	Valplast polyamide RPDs (n = 30)	Median (IQR): 39 (42) Range: 14 to 178	NR	P < 0.001 Post hoc test: Flexible vs. acetal: P < 0.001 Flexible vs. PMMA: P < 0.001 PMMA vs. acetal: P = 0.048
		Acetal RPDs ^d (n = 30)	Median (IQR): 71 (41) Range: 29 to 250	NR	
		PMMA RPDs (n = 30)	Median (IQR): 99 (64) Range: 45 to 272	NR	
Follow-up: Up to 6 months					
Fayad et al. (2018) ³³ Parallel-group RCT Outcome: Maximum bite force Measurement: Occlusal force metre ^f	Baseline	Vertex ThermoSens thermoplastic RCD (n = 50)	Mean (SD): 34.37 (12.25), SE: 1.93	NA	0.819

Citation and study design Outcome name and measurement method	Time points	Intervention groups and number of participants (n)	Outcome result	Within-group difference from baseline (P value)	Between-group difference (P value)
		Vertex Regular, conventional heat-cured acrylic RCD (n = 50)	Mean (SD): 33.75 (12.07), SE: 1.90	NA	0.007
	6 months	Vertex ThermoSens thermoplastic RCD (n = 50)	Mean (SD): 47.50 (11.30), SE: 1.74	NR	
		Vertex Regular, conventional heat-cured acrylic RCD (n = 50)	Mean (SD): 39.37 (14.85), SE: 2.34	NR	
Follow-up: Up to 1 year					
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Chewing ability Measurement: Subjective response to 1 question (2 response options)	1 year	Valplast flexible RPD (n = 40)			0.27
		Kennedy Class I or II	Not satisfied: 6 (30%) Satisfied: 14 (70%)	NA	
		Kennedy Class III or IV	Not satisfied 2 (10%) Satisfied: 18 (90%)	NA	
		Cr-Co RPD (n = 40)			
		Kennedy Class I or II	Not satisfied: 4 (20%) Satisfied: 16 (80%)	NA	
		Kennedy Class III or IV	Not satisfied 2 (10%) Satisfied: 18 (90%)	NA	
		PMMA-RPD (n = 40)			

Citation and study design Outcome name and measurement method	Time points	Intervention groups and number of participants (n)	Outcome result	Within-group difference from baseline (P value)	Between-group difference (P value)
		Kennedy Class I or II	Not satisfied: 7 (35%) Satisfied: 13 (65%)	NA	
		Kennedy Class III or IV	Not satisfied 5 (25%) Satisfied: 15 (75%)	NA	

CO = crossover; IQR = interquartile range; NA = not applicable; NR = not reported; PMMA = polymethyl methacrylate; RCD = removable complete denture; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation; vs. = versus.

^aPatient or caregiver reported 10 questions about potential difficulties, 5-point Likert scale with scores 0 (Never) to 4 (Very often).

^bDefined based on the mass of particles of various sizes remaining after chewing 3 g of peanuts for 40 chewing cycles. Theoretical values of the chewing efficiency coefficient could range between 1.5 and 4.5. More details and calculations are provided in the publication.³⁴

^cIt was unclear from this report if baseline measurements were conducted with or without dentures inserted.

^dAcetal-based framework and clasps, PMMA base, and teeth.

^eDetails in publication.³⁴

^fPatients were instructed to bite as powerfully as possible 3 times per side with a rest time of 2 minutes in between. The highest of the 3 records was the patient's maximum bite force.

Table 5: Summary of Findings by Outcome — Aesthetics

Citation and study design Outcome name and measurement method	Intervention and comparator group(s) and number of participants (n)	Outcome label	Outcome result n (%)	Between-group difference (as reported)	P value for between-group difference
Follow-up: 1 month					
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰ CO-RCT Outcome: Satisfaction with appearance Measurement: Interviewer-administered 100 mm VAS, reclassified into 4 categories ^a	Valplast flexible RPDs (n = 30)	Totally dissatisfied	0 (0%)	More satisfied with: flexible RPD: n = 16 acrylic RPD: n = 4 Similarly satisfied with both: n = 10	P value for Wilcoxon signed rank test: 0.06 ^b
		Slightly dissatisfied	1 (3.3%)		
		Slightly satisfied	2 (6.7%)		
		Satisfied	27 (90%)		
	Acrylic RPDs (n = 30)	Totally dissatisfied	1 (3.3%)		
		Slightly dissatisfied	1 (3.3%)		
		Slightly satisfied	5 (16.7%)		

Citation and study design Outcome name and measurement method	Intervention and comparator group(s) and number of participants (n)	Outcome label	Outcome result n (%)	Between-group difference (as reported)	P value for between-group difference
		Satisfied	23 (76.7%)		
Follow-up: 1 year					
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Aesthetic satisfaction Measurement: 1 question (3 response options)	Valplast flexible RPD (n = 40)			NR	P < 0.001 (Chi-square)
	Kennedy Class I or II	Not satisfied	1 (5%)		
		Satisfied	18 (90%)		
		Very satisfied	1 (5%)		
	Kennedy Class III or IV	Not satisfied	0 (0%)		
		Satisfied	15 (75%)		
		Very satisfied	5 (25%)		
	Cr-Co RPD (n = 40)				
	Kennedy Class I or II	Not satisfied	12 (60%)		
		Satisfied	8 (40%)		
		Very satisfied	0 (0%)		
	Kennedy Class III or IV	Not satisfied	13 (65%)		
		Satisfied	7 (35%)		
		Very satisfied	0 (0%)		
	PMMA-RPD (n = 40)				
	Kennedy Class I or II	Not satisfied	14 (70%)		
		Satisfied	6 (30%)		
		Very satisfied	0 (0%)		
	Kennedy Class III or IV	Not satisfied	5 (25%)		
		Satisfied	15 (75%)		
		Very satisfied	0 (0%)		
Follow-up: Unclear ^c					
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Aesthetics, subjective assessment Measurement: 1 question (3 response options converted)	Valplast RPD (n = 15)	NA	Mean (SD): 1.67 (0.488) Range: 1 to 2 Median: 2	NR	Unclear ^d

Citation and study design Outcome name and measurement method	Intervention and comparator group(s) and number of participants (n)	Outcome label	Outcome result n (%)	Between- group difference (as reported)	P value for between- group difference
to scores 0 to 2 — higher is better)					
	Cr-Co alloy with PMMA base RPD (n = 15)	NA	Mean (SD): 0.67 (0.488) Range: 0 to 1 Median: 1	NR	
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Aesthetics, objective assessment Measurement: Clinician assessment with extraoral and intraoral photographs (3 response scores 0 to 2 — higher is better)	Valplast RPD (n = 15)	NA	Mean (SD): 1.4 (0.507) Range: 1 to 2 Median: 1	NR	Unclear ^d
	Cr-Co alloy with PMMA base RPD (n = 15)	NA	Mean (SD): 0 (0) Range: 0 to 0 Median: 0	NR	

CO = crossover; Cr-Co = chromium-cobalt; NA = not applicable; NR = not reported; PMMA = polymethyl methacrylate (acrylic); RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation; VAS = visual analogue scale.

^aThe scores from the VAS, a continuous graphical rating scale from 0 to 100 were classified as totally dissatisfied (0 to 31), slightly dissatisfied (> 31 to 50), slightly satisfied (> 50 to 79), and satisfied (80 to 100).

^bSubgroup analyses were also conducted for age, gender, and socioeconomic status; no significant differences reported based on $P \leq 0.05$ (unclear power to detect differences)

^cTiming of outcome assessment is unclear for this study. After insertion of the prosthesis, the "clinical performances were reviewed periodically during one and half years for the nine parameters as listed in Table 1. The periodicity of recall was twenty-four hours, one week, one month, three months and six months after insertion of prostheses."

^dAbstract states: "statistically significant results were obtained in favor of flexible RPDs, in the parameters of 'aesthetics'." No other details are provided.

Table 6: Summary of Findings by Outcome — Speech or Phonetics

Citation and study design	Outcome name and measurement method	Intervention and comparator groups and number of participants (n)	Outcome label	Outcome result n (%)	Difference from baseline	Between-group difference (as reported)	P value for between-group difference
Follow-up: 1 month							
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰ CO-RCT	Outcome: Satisfaction with ability to speak Measurement: 100 mm VAS, categorized into 1 of 4 groups ^a	Valplast flexible RPDs (n = 30)	Totally dissatisfied	0 (0%)	NR	More satisfied with: flexible RPD: n = 19 acrylic RPD: n = 6 Similarly satisfied with both: n = 11	P value for Wilcoxon signed rank test: 0.20 ^b
			Slightly dissatisfied	2 (6.7%)	NR		
			Slightly satisfied	3 (10.0%)	NR		
			Satisfied	25 (83.3%)	NR		
		Acrylic RPDs (n = 30)	Totally dissatisfied	0 (0%)	NR		
			Slightly dissatisfied	2 (6.7%)	NR		
			Slightly satisfied	5 (16.7%)	NR		
			Satisfied	23 (76.7%)	NR		
	Outcome: Trouble pronouncing words Measurement: Question on OHIP-14 questionnaire	Valplast flexible RPDs (n = 30)	Prevalence of grouped responses (occasionally, fairly often and very often) ^c	6 (20.0%)	MD (SD): 0.7 (2.2) CI: - 0.1 to 1.5 P = 0.08	NR	NR
		Acrylic RPDs (n = 30)		11 (36.6%)	MD (SD): 0.5 (2.4) CI: - 0.4 to 1.4 P = 0.29		

Citation and study design	Outcome name and measurement method	Intervention and comparator groups and number of participants (n)	Outcome label	Outcome result n (%)	Difference from baseline	Between-group difference (as reported)	P value for between-group difference
Follow-up: 1 year							
Manzon et al. (2019) ³¹ Nonrandomized controlled study	Outcome: Speech defects/difficulties Measurement: Question with 2 response options	Valplast flexible RPD (n = 40)					P < 0.002 (Chi-square)
		Kennedy Class I or II	Yes	0 (0%)	NR	NR	
			No	20 (100%)	NR	NR	
		Kennedy Class III or IV	Yes	0 (0%)	NR	NR	
			No	20 (100%)	NR	NR	
		Cr-Co RPD (n = 40)					
		Kennedy Class I or II	Yes	0 (0%)	NR	NR	
			No	20 (100%)	NR	NR	
		Kennedy Class III or IV	Yes	0 (0%)	NR	NR	
			No	20 (100%)	NR	NR	
		PMMA-RPD (n = 40)					
		Kennedy Class I or II	Yes	5 (25%)	NR	NR	
			No	15 (75%)	NR	NR	
		Kennedy Class III or IV	Yes	2 (10%)	NR	NR	
			No	18 (90%)	NR	NR	

CI = confidence interval; CO = crossover; MD = mean difference; NR = not reported; OHIP-14 = Oral Health Impact Profile-14; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation; VAS = visual analogue scale.

^aThe scores from the VAS, a continuous graphical rating scale from 0 to 100 were classified as totally dissatisfied (0 to 31), slightly dissatisfied (> 31 to 50), slightly satisfied (> 50 to 79), and satisfied (80 to 100).

^bSubgroup analyses were conducted for age, gender, and socioeconomic status; no significant differences reported based on $P \leq 0.05$ (unclear power to detect differences).

^cBaseline prevalence (total sample, n = 30) of grouped responses (occasionally, fairly often, or very often) 14 (46.7%).

Table 7: Summary of Findings by Outcome — Denture Retention

Citation and study design Outcome name and measurement method	Time points	Intervention and comparison groups and number of participants (n)	Outcome label	Outcome result	Between-group difference (P value)
Follow-up: Up to 3 months					
Olawale et al. (2022) ²⁷ RCT-CO Outcome: Retention Measurement: Kapur's retention score, categorized ^a	7 days	Flexite plus RCDs (n = 10)	No retention	0 (0%)	NR
			Minimum retention	1 (10%)	
			Moderate retention	6 (60%)	
			Good retention	3 (30%)	
		Acrylic RCDs (n = 10)	No retention	0 (0%)	
			Minimum retention	0 (0%)	
			Moderate retention	3 (30%)	
			Good retention	7 (70%)	
	1 month	Flexite plus RCDs (n = 10)	No retention	0 (0%)	
			Minimum retention	0 (0%)	
			Moderate retention	5 (50%)	
			Good retention	5 (50%)	
		Acrylic RCDs (n = 10)	No retention	0 (0%)	
			Minimum retention	0 (0%)	
			Moderate retention	1 (10%)	
			Good retention	9 (90%)	
	3 months	Flexite plus RCDs (n = 10)	No retention	0 (0%)	
			Minimum retention	0 (0%)	
			Moderate retention	7 (70%)	
			Good retention	3 (30%)	
		Acrylic RCDs (n = 10)	No retention	0 (0%)	
			Minimum retention	0 (0%)	
			Moderate retention	0 (0%)	
			Good retention	10 (100%)	
Olawale et al. (2022) ²⁷ RCT-CO Outcome: Retention Measurement: 100 mm	3 months	Flexite plus RCDs (n = 10)	Totally dissatisfied	0 (0%)	0.157

Citation and study design Outcome name and measurement method	Time points	Intervention and comparison groups and number of participants (n)	Outcome label	Outcome result	Between-group difference (P value)	
VAS, categorized into 4 groups ^b						
			Dissatisfied	2 (20%)		
			Satisfied	3 (30%)		
			Totally satisfied	5 (50%)		
			Mean VAS score (SD)	73.0 (15.67)		
		Acrylic RCDs (n = 10)	Totally dissatisfied	0 (0%)		
			Dissatisfied	1 (10%)		
			Satisfied	1 (10%)		
			Totally satisfied	8 (80%)		
			Mean VAS score (SD)	84.6 (16.88)		
Olawale et al. (2022) ²⁷ RCT-CO Outcome: Retention Measurement: Pull digital force gauge (units: Newtons)	1 week	Flexite plus RCDs (n = 10)	NA	Mean (SD): 27.39 (14.50)	0.050	
		Acrylic RCDs (n = 10)	NA	Mean (SD): 34.17 (17.76)		
	1 month	Flexite plus RCDs (n = 10)	NA	Mean (SD): 28.64 (13.34)	0.016	
		Acrylic RCDs (n = 10)	NA	Mean (SD): 37.24 (18.16)		
	3 months	Flexite plus RCDs (n = 10)	NA	Mean (SD): 29.88 (14.36)	0.002	
		Acrylic RCDs (n = 10)	NA	Mean (SD): 39.70 (17.09)		
	Follow-up: Up to 1 year					
	Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Retention of the prosthesis Measurement: Patient-reported, subjective response 1 question (2 response options)	1 year	Valplast flexible RPD (n = 40)			< 0.001

Citation and study design Outcome name and measurement method	Time points	Intervention and comparison groups and number of participants (n)	Outcome label	Outcome result	Between-group difference (P value)	
		Kennedy Class I or II	Same as before	11 (55%)		
			Decreased	9 (45%)		
		Kennedy Class III or IV	Same as before	13 (65%)		
			Decreased	7 (35%)		
		Cr-Co RPD (n = 40)				
		Kennedy Class I or II	Same as before	20 (100%)		
			Decreased	(0%)		
		Kennedy Class III or IV	Same as before	20 (100%)		
			Decreased	(0%)		
		PMMA-RPD (n = 40)				
		Kennedy Class I or II	Same as before	20 (100%)		
			Decreased	(0%)		
		Kennedy Class III or IV	Same as before	20 (100%)		
			Decreased	(0%)		

CO = crossover; Cr-Co = chromium-cobalt; NA = not applicable; NR = not reported; PMMA = polymethyl methacrylate; RCD = removable complete denture; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation; VAS = visual analogue scale.

^aKapur's score is calculated based on a standard questionnaire;⁴³ and was graded. Grade 0 = No retention (the denture displaces itself when patient talks); 1 = Minimum retention (denture offers slight resistance to vertical pull and no resistance to lateral pull); 2 = Moderate retention (denture offers slight resistance to lateral pull); and 3 = Good retention (denture offers maximum resistance to vertical and lateral forces).

^bThe scores from the VAS, a continuous graphical rating scale from 0 to 100 were classified as: totally dissatisfied (0 to 30), dissatisfied (> 31 to 50), satisfied (> 50 to 79) and totally satisfied (80 to 100).

Table 8: Summary of Findings by Outcome — Comfort or Pain While Eating or Chewing

Citation and study design Outcome name and measurement method	Intervention group(s) and number of participants (n)	Outcome label	Outcome result	Difference from baseline	Between-group difference (as reported)	P value for between-group difference
Follow-up: 1 month						
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰ CO- RCT Outcome: Satisfaction with comfort while eating Measurement: 100 mm VAS, categorized into 4 groups ^a	Valplast flexible RPDs (n = 30)	Totally dissatisfied	2 (6.7%)	NR	More satisfied with: flexible RPD: n = 19 acrylic RPD: n = 6 Similarly satisfied with both: n = 5	P value for Wilcoxon signed rank test: 0.06 ^b
		Slightly dissatisfied	0 (0%)			
		Slightly satisfied	3 (10.0%)			
		Satisfied	25 (83.3%)			
	Acrylic RPDs (n = 30)	Totally dissatisfied	1 (3.3%)	NR		
		Slightly dissatisfied	1 (3.3%)			
		Slightly satisfied	8 (26.7%)			
		Satisfied	20 (66.7%)			
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰ CO-RCT Outcome: Found it uncomfortable to eat Measurement: Question on OHIP- 14 questionnaire	Valplast flexible RPDs (n = 30)	Prevalence of grouped responses (occasionally, fairly often, and very often) ^c	9 (30.0%)	MD (SD) = 0.2 (2.3) CI = −0.1 to 0.7 P = 0.69	NR	NR
			Acrylic RPDs (n = 30)	9 (30.0%)		

Citation and study design Outcome name and measurement method	Intervention group(s) and number of participants (n)	Outcome label	Outcome result	Difference from baseline	Between-group difference (as reported)	P value for between-group difference
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰ CO- RCT Outcome: Painful aching in mouth Measurement: Question on OHIP-14 questionnaire	Valplast flexible RPDs (n = 30)	Prevalence of grouped responses (occasionally, fairly often and very often) ^c	4 (13.3%)	MD (SD) = 0.1 (1.4) CI = −0.4 to 0.6 P = 0.69	NR	NR
	Acrylic RPDs (n = 30)		2 (6.7%)	MD (SD) = 0.5 (1.3) CI = 0.0 to 1.0 P = 0.04		
Follow-up: 1 year						
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Discomfort/pain during mastication Measurement: Patient-reported, subjective response 1 question (2 response options)	Valplast flexible RPD (n = 40)			NA	NR	0.10
	Kennedy Class I or II	Yes	11 (55%)			
		No	9 (45%)			
	Kennedy Class III or IV	Yes	6 (30%)			
		No	14 (70%)			
	Cr-Co RPD (n = 40)			NA		
	Kennedy Class I or II	Yes	5 (25%)			
		No	15 (75%)			
	Kennedy Class III or IV	Yes	3 (15%)			
		No	17 (85%)			
PMMA-RPD (n = 40)			NA			

Citation and study design Outcome name and measurement method	Intervention group(s) and number of participants (n)	Outcome label	Outcome result	Difference from baseline	Between-group difference (as reported)	P value for between-group difference
	Kennedy Class I or II	Yes	8 (40%)			
		No	12 (60%)			
	Kennedy Class III or IV	Yes	5 (25%)			
		No	15 (75%)			

CI = confidence interval; CO = crossover; Cr-Co = chromium-cobalt; MD = mean difference; NA = not applicable; NR = not reported; OHIP-14 = Oral Health Impact Profile-14; PMMA = polymethyl methacrylate; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation; VAS = visual analogue scale.

^aThe scores from the VAS, a continuous graphical rating scale from 0 to 100 were classified as: totally dissatisfied (0 to 31), slightly dissatisfied (> 31 to 50), slightly satisfied (> 50 to 79), and satisfied (80 to 100).

^bSubgroup analyses were conducted for age, gender, and socioeconomic status; no significant differences reported based on $P \leq 0.05$ (unclear power to detect differences).

^cBaseline prevalence (total sample, n = 30) of grouped responses (occasionally, fairly often, or very often). Found it uncomfortable to eat: 8 (26.7%); painful aching in mouth: 9 (30%).

Table 9: Summary of Findings by Outcome — Other Complications

Citation and study design Outcome name and measurement method	Intervention and control groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
Follow-up: 1 year				
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Roughness perceived by the tongue Measurement: Patient-reported, subjective response 1 question (2 response options)	Valplast flexible RPD (n = 40)			Chi-square P value < 0.001
	Kennedy Class I or II	Smooth prosthesis	12 (60%)	
		Wrinkled prosthesis	8 (40%)	
	Kennedy Class III or IV	Smooth prosthesis	10 (50%)	
		Wrinkled prosthesis	10 (50%)	
	Cr-Co RPD (n = 40)			
	Kennedy Class I or II	Smooth prosthesis	20 (100%)	
		Wrinkled prosthesis	0 (0%)	
	Kennedy Class III or IV	Smooth prosthesis	20 (100%)	
		Wrinkled prosthesis	0 (0%)	
	PMMA-RPD (n = 40)			
	Kennedy Class I or II	Smooth prosthesis	20 (100%)	
		Wrinkled prosthesis	0 (0%)	
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Feeling of encumbrance Measurement: Patient-reported, subjective response 1 question (3 response options)	Valplast flexible RPD (n = 40)			Chi-square P value < 0.001
	Kennedy Class I or II	No encumbrance	18 (90%)	
		Little encumbrance	2 (10%)	
		Very cumbersome	0 (0%)	
	Kennedy Class III or IV	No encumbrance	17 (65%)	
		Little encumbrance	3 (15%)	
		Very cumbersome	0 (0%)	

Citation and study design Outcome name and measurement method	Intervention and control groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
	Cr-Co RPD (n = 40)			
	Kennedy Class I or II	No encumbrance	12 (60%)	
		Little encumbrance	8 (40%)	
		Very cumbersome	0 (0%)	
	Kennedy Class III or IV	No encumbrance	13 (65%)	
		Little encumbrance	7 (35%)	
		Very cumbersome	0 (0%)	
	PMMA-RPD (n = 40)			
	Kennedy Class I or II	No encumbrance	3 (15%)	
		Little encumbrance	5 (25%)	
		Very cumbersome	12 (60%)	
	Kennedy Class III or IV	No encumbrance	3 (15%)	
		Little encumbrance	6 (30%)	
		Very cumbersome	11 (55%)	
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Calculus presence on prosthesis Measurement: Clinician-assessed (3 response options)	Valplast flexible RPD (n = 40)			Chi-square P value = 0.23
	Kennedy Class I or II	Calculus free	17 (85%)	
		Covering < 1/3 of prosthesis	3 (15%)	
		Covering > 1/3 of prosthesis	0 (0%)	
	Kennedy Class III or IV	Calculus free	20 (100%)	
		Covering < 1/3 of prosthesis	0 (0%)	
		Covering > 1/3 of prosthesis	0 (0%)	
	Cr-Co RPD (n = 40)			
	Kennedy Class I or II	Calculus free	20 (100%)	
		Covering < 1/3 of prosthesis	0 (0%)	
		Covering > 1/3 of prosthesis	0 (0%)	

Citation and study design Outcome name and measurement method	Intervention and control groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference		
	Kennedy Class III or IV	Calculus free	20 (100%)			
		Covering < 1/3 of prosthesis	0 (0%)			
		Covering > 1/3 of prosthesis	0 (0%)			
	PMMA-RPD (n = 40)					
	Kennedy Class I or II	Calculus free	19 (95%)			
		Covering < 1/3 of prosthesis	1 (5%)			
		Covering > 1/3 of prosthesis	0 (0%)			
	Kennedy Class III or IV	Calculus free	17 (65%)			
		Covering < 1/3 of prosthesis	3 (15%)			
		Covering > 1/3 of prosthesis	0 (0%)			
	Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Plaque presence on abutment teeth Measurement: Clinician-assessed (2 response options)	Valplast flexible RPD (n = 40)			Chi-square P value 0.37	
		Kennedy Class I or II	Yes			13 (65%)
No			7 (35%)			
Kennedy Class III or IV		Yes	12 (60%)			
		No	8 (40%)			
Cr-Co RPD (n = 40)						
Kennedy Class I or II		Yes	7 (35%)			
		No	13 (65%)			
Kennedy Class III or IV		Yes	8 (40%)			
		No	12 (60%)			
PMMA-RPD (n = 40)						
Kennedy Class I or II		Yes	10 (50%)			
		No	10 (50%)			
Kennedy Class III or IV		Yes	9 (45%)			
		No	11 (55%)			

Citation and study design Outcome name and measurement method	Intervention and control groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Abutment teeth health Measurement: Clinician-assessed (3 response options)	Valplast flexible RPD (n = 40)			Chi-square P value: 0.28
	Kennedy Class I or II	Same as before	17 (85%)	
		Decay	3 (15%)	
		Dental mobility	0 (0%)	
	Kennedy Class III or IV	Same as before	19 (95%)	
		Decay	1 (5%)	
		Dental mobility	0 (0%)	
	Cr-Co RPD (n = 40)			
	Kennedy Class I or II	Same as before	19 (95%)	
		Decay	1 (5%)	
		Dental mobility	0 (0%)	
	Kennedy Class III or IV	Same as before	20 (100%)	
		Decay	0 (0%)	
		Dental mobility	0 (0%)	
	PMMA-RPD (n = 40)			
	Kennedy Class I or II	Same as before	20 (100%)	
		Decay	0 (0%)	
		Dental mobility	0 (0%)	
	Kennedy Class III or IV	Same as before	18 (90%)	
		Decay	2 (10%)	
		Dental mobility	0 (0%)	
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Change in occlusal position Measurement: Clinician-assessed (2 response options)	Valplast flexible RPD (n = 40)			Chi-square P value 0.07
	Kennedy Class I or II	Yes	2 (10%)	
		No	18 (90%)	
	Kennedy Class III or IV	Yes	0 (0%)	
		No	20 (100%)	

Citation and study design Outcome name and measurement method	Intervention and control groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
	Cr-Co RPD (n = 40)			
	Kennedy Class I or II	Yes	0 (0%)	
		No	20 (100%)	
	Kennedy Class III or IV	Yes	0 (0%)	
		No	20 (100%)	
	PMMA-RPD (n = 40)			
	Kennedy Class I or II	Yes	0 (0%)	
		No	20 (100%)	
	Kennedy Class III or IV	Yes	0 (0%)	
		No	20 (100%)	
Follow-up: 24 months				
Sadek and Elawady (2019) ³² Parallel-group RCT Outcome: Survival rate of abutment teeth Measurement: Clinically stable, functioning abutments without any mobility	Thermopress RPD (n = 14)		100%	Kaplan Maier - P value = 0.104
	Vitallium RPD (n = 14)		10 (71.4%)	
	Vitallium RPD with surveyed bridge (n = 14)		12 (85.7%)	

Cr-Co = chromium-cobalt; PMMA = polymethyl methacrylate; RCT = randomized controlled trial; RPD = removable partial denture.

Table 10: Summary of Findings by Outcome — Tissue and Periodontal Health

Citation and study design Outcome name and measurement method	Intervention groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
Follow-up: 1 year				
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Mucosa redness of edentulous areas Measurement: Clinician-assessed (2 response options)	Valplast flexible RPD (n = 40)			Chi-square P value = 0.13
	Kennedy Class I or II	Yes	12 (60%)	
		No	8 (40%)	
	Kennedy Class III or IV	Yes	9 (45%)	
		No	11 (55%)	

Citation and study design Outcome name and measurement method	Intervention groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference		
	Cr-Co RPD (n = 40)					
	Kennedy Class I or II	Yes	6 (30%)			
		No	14 (70%)			
	Kennedy Class III or IV	Yes	4 (20%)			
		No	16 (80%)			
	PMMA-RPD (n = 40)					
	Kennedy Class I or II	Yes	10 (50%)			
		No	10 (50%)			
	Kennedy Class III or IV	Yes	8 (40%)			
		No	12 (60%)			
	Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Mucosa redness around abutment teeth Measurement: Clinician-assessed (2 response options)	Valplast flexible RPD (n = 40)			Chi-square P value < 0.001	
		Kennedy Class I or II	Yes			18 (90%)
No			2 (10%)			
Kennedy Class III or IV		Yes	15 (75%)			
		No	5 (25%)			
Cr-Co RPD (n = 40)						
Kennedy Class I or II		Yes	8 (40%)			
		No	12 (60%)			
Kennedy Class III or IV		Yes	4 (20%)			
		No	16 (80%)			
PMMA-RPD (n = 40)						
Kennedy Class I or II		Yes	14 (70%)			
		No	6 (30%)			
Kennedy Class III or IV		Yes	12 (60%)			
		No	8 (40%)			
Follow-up: Unclear ^a						
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Oral soft tissue tolerance, subjective assessment Measurement: Participant responses to 1	Valplast RPD (n = 15)	NA	Mean (SD): 0.27 (0.458) Range: 0 to 1 Median: 0	Unclear ^b		

Citation and study design Outcome name and measurement method	Intervention groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
question (3 response options with scores 0 to 3 — lower scores are better)				
	Cr-Co alloy with PMMA base RPD (n = 15)	NA	Mean (SD): 0.13 (0.352) Range: 0 to 1 Median: 0	
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Oral soft tissue tolerance, objective assessment Measurement: Clinician responses to 1 question (2 response options with scores 0 to 1 — lower is better)	Valplast RPD (n = 15)	NA	Mean (SD): 0 (0) Range: 0 to 0 Median: 0	Unclear ^b
	Cr-Co alloy with PMMA base RPD (n = 15)	NA	Mean (SD): 0 (0) Range: 0 to 0 Median: 0	
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Gingival health Measurement: Clinician-assessed using Gingival index of Loe H and Sillness J (1963) (scores 0 to 3, lower is better)	Valplast RPD (n = 15)	NA	Mean (SD): 0 (0) Range: 0 to 0 Median: 0	Unclear ^b
	Cr-Co alloy with PMMA base RPD (n = 15)	NA	Mean (SD): 0 (0) Range: 0 to 0 Median: 0	
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Periodontal health Measurement: Clinician-assessed using Periodontal index of AL Russell (1967) (range 0 to 8, lower is better)	Valplast RPD (n = 15)	NA	Mean (SD): 0 (0) Range: 0 to 0 Median: 0	Unclear ^b
	Cr-Co alloy with PMMA base RPD (n = 15)	NA	Mean (SD): 0 (0) Range: 0 to 0 Median: 0	
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Adaptability in areas with undercut Measurement: Clinician-assessed —	Valplast RPD (n = 15)	NA	Mean (SD): 0.73 (0.458) Range: 0 to 1 Median: 1	Unclear ^b

Citation and study design Outcome name and measurement method	Intervention groups and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
whether a block out is required — score 0 to 1, lower is better				
	Cr-Co alloy with PMMA base RPD (n = 15)	NA	Mean (SD): 0.87 (0.352) Range: 0 to 1 Median: 1	

Cr-Co = chromium-cobalt; NA = not applicable; PMMA = polymethyl methacrylate; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation.

^aAfter insertion of the prosthesis, their clinical performances were reviewed periodically during one and half years for the 9 parameters as listed in [Table 1](#). The periodicity of recall was 24 hours, 1 week, 1 month, 3 months and 6 months after insertion of prostheses."

^bFrom abstract: "The clinical parameters of 'oral soft tissue tolerance,' 'gingival health', 'periodontal health' and 'adaptability in areas with undercut' were statistically at par for all the 30 patients thus suggesting the comparable biocompatibility of the two materials." No other details are provided.

Table 11: Summary of Findings by Outcome — Technical Complications

Citation and study design Outcome name and measurement method	Intervention group and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
Follow-up: 1 year				
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Prosthesis fractures Measurement: Clinician-assessed (2 response options)	Valplast flexible RPD (n = 40)			NA
	Kennedy Class I or II	Yes	0 (0%) dentures with clasp fractures or denture base fractures for any Kennedy classification	
		No		
	Kennedy Class III or IV	Yes		
		No		
	Cr-Co RPD (n = 40)			
	Kennedy Class I or II	Yes	0 (0%) dentures with clasps fractures or denture base fractures for any Kennedy classification	
No				

Citation and study design Outcome name and measurement method	Intervention group and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
	Kennedy Class III or IV	Yes		
		No		
	PMMA-RPD (n = 40)			
	Kennedy Class I or II	Yes	0 (0%) dentures with clasps factures or denture base fractures for any Kennedy classification	
		No		
	Kennedy Class III or IV	Yes		
		No		
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Discoloration of prosthesis Measurement: Clinician-assessed (2 response options)	Valplast flexible RPD (n = 40)			Chi-square P value = 0.54
Kennedy Class I or II	Yes	1 (5%)		
	No	19 (95%)		
Kennedy Class III or IV	Yes	1 (5%)		
	No	19 (95%)		
Cr-Co RPD (n = 40)				
Kennedy Class I or II	Yes	0 (0%)		
	No	20 (100%)		
Kennedy Class III or IV	Yes	0 (0%)		
	No	20 (100%)		
PMMA-RPD (n = 40)				
Kennedy Class I or II	Yes	0 (0%)		
	No	20 (100%)		
Kennedy Class III or IV	Yes	0 (0%)		
	No	20 (100%)		
Manzon et al. (2019) ³¹ Nonrandomized controlled study Outcome: Loss of artificial teeth Measurement: Clinician-assessed (2 response options)	Valplast flexible RPD (n = 40)			Chi-square P value = 0.04

Citation and study design Outcome name and measurement method	Intervention group and number of participants (n)	Outcome label	Outcome result	P value for between-group difference
	Kennedy Class I or II	Yes	3 (15%)	
		No	17 (85%)	
	Kennedy Class III or IV	Yes	1 (5%)	
		No	19 (95%)	
	Cr-Co RPD (n = 40)			
	Kennedy Class I or II	Yes	0 (0%)	
		No	20 (100%)	
	Kennedy Class III or IV	Yes	0 (0%)	
		No	20 (100%)	
	PMMA-RPD (n = 40)			
	Kennedy Class I or II	Yes	0 (0%)	
		No	20 (100%)	
	Kennedy Class III or IV	Yes	0 (0%)	
		No	20 (100%)	
Follow-up: Unclear ^a				
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Frequency of fracture/repair of RPD, objective Measurement: Clinician-assessed (2 response options converted to scores of 0 or 1 — higher scores are better)	Valplast RPD (n = 15)	NA	Mean (SD): 0.67 (0.488) Range: 0 to 1 Median: 1	NR
	Cr-Co alloy with PMMA- RPD base	NA	Mean (SD): 0.8 (0.414) Range: 0 to 1 Median: 1	

Cr-Co = chromium-cobalt; NR = not reported; PMMA = polymethyl methacrylate; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation.

^aFrom report: "After insertion of the prosthesis, their clinical performances were reviewed periodically during one and half years for the nine parameters as listed in Table 1. The periodicity of recall was 24 hours, 1 week, 1 month, 3 months, and 6 months after insertion of prostheses."

Table 12: Summary of Findings by Outcome — Overall Patient Satisfaction

Citation and study design Outcome name and measurement method	Intervention and comparator group and number of participants (n)	Outcome result n (%)	Between-group difference (as reported)	P value for between-group difference
Follow-up: 1 month				
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰	Valplast flexible RPDs (n = 30)	NR	More satisfied with:	P value for Wilcoxon signed rank test: 0.04 ^b

Citation and study design Outcome name and measurement method	Intervention and comparator group and number of participants (n)	Outcome result n (%)	Between-group difference (as reported)	P value for between-group difference
CO-RCT Outcome: Overall satisfaction Measurement: 100 mm VAS, categorized into 4 groups ^a			flexible RPD: n = 21 acrylic RPD: n = 6 Similarly satisfied with both: n = 3	
	Acrylic RPDs (n = 30)	NR		
Follow-up: Unclear ^c				
Hundal and Madan (2015) ³⁵ Parallel-group RCT Outcome: Overall patient satisfaction, subjective assessment Measurement: Participant responses to 1 question (4 response options with scores 0 to 3, higher is better)	Valplast RPD (n = 15)	Mean (SD): 2.07 (0.594) Range: 1 to 3 Median: 2	NR	Unclear ^d
	Cr-Co alloy with PMMA base RPD (n = 15)	Mean (SD): 1.47 (0.516) Range: 1 to 2 Median: 1		

CO = crossover; Cr-Co = chromium-cobalt; PMMA = polymethyl methacrylate; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation; VAS = visual analogue scale.

^aThe scores from the VAS, a continuous graphical rating scale from 0 to 100 were classified as totally dissatisfied (0 to 31), slightly dissatisfied (> 31 to 50), slightly satisfied (> 50 to 79), and satisfied (80 to 100).

^bSubgroup analyses were conducted for age, gender, and socioeconomic status; no significant differences reported based on $P \leq 0.05$ (unclear power to detect differences).

^cFrom report: "After insertion of the prosthesis, their clinical performances were reviewed periodically during one and half years for the nine parameters as listed in Table 1. The periodicity of recall was 24 hours, 1 week, 1 month, 3 months, and 6 months after insertion of prostheses."

^dFrom abstract: "Statistically significant results were obtained in favor of flexible RPDs, in the parameters of 'overall patient satisfaction'."

Table 13: Summary of Findings by Outcome — OHRQoL (Overall and Domain-Specific)

Citation and study design	Outcome name and measurement method	Interventions and number of participants (n)	Baseline	Follow-up	Within-group difference between baseline and follow-up (as reported)	P value for within-group change from baseline	Between-group difference (as reported) and P value
Follow-up: 1 month							
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰ CO- RCT ^a	Summary OHIP-14 score (lower is better)	Valplast flexible RPDs (n = 30)	Mean (SD): 12.4 (9.8)	Mean (SD): 3.8 (5.6)	MD (SD): 8.6 (11.7) 95% CI, 4.3 to 13.0	< 0.001	NR
		Acrylic RPDs (n = 30)		Mean (SD): 4.8 (5.3)	MD (SD): 7.7 (11.6) 95% CI, 3.3 to 12.0	0.001	
	OHIP-14 domain score: Functional Limitation	Valplast flexible RPDs (n = 30)	NR	NR	MD (SD): 0.7 (2.6) 95% CI, -0.3 to 1.6	0.16	NR
		Acrylic RPDs (n = 30)	NR	NR	MD (SD): 0.3 (2.4) 95% CI, -0.6 to 1.2	0.49	
	OHIP-14 domain score: Physical Pain	Valplast flexible RPDs (n = 30)	NR	NR	MD (SD): -0.1 (3.3) 95% CI, -1.4 to 1.1	0.83	NR
		Acrylic RPDs (n = 30)	NR	NR	MD (SD): 0.4 (2.9) 95% CI, -0.6 to 1.5	0.42	
	OHIP-14 domain score: Psychological Discomfort	Valplast flexible RPDs (n = 30)	NR	NR	MD (SD): 2.7 (2.5) 95% CI, 1.8 to 3.7	< 0.001	NR
		Acrylic RPDs (n = 30)	NR	NR	MD (SD): 2.6 (2.7) 95% CI, 1.6 to 3.6	< 0.001	
	OHIP-14 domain score: Physical Disability	Valplast flexible RPDs (n = 30)	NR	NR	MD (SD): 0.4 (1.9) 95% CI, -0.3 to 1.1	0.22	NR

Citation and study design	Outcome name and measurement method	Interventions and number of participants (n)	Baseline	Follow-up	Within-group difference between baseline and follow-up (as reported)	P value for within-group change from baseline	Between-group difference (as reported) and P value
		Acrylic RPDs (n = 30)	NR	NR	MD (SD): −0.1 (2.3) 95% CI, −1.0 to 0.7	0.76	NR
	OHIP-14 domain score: Social Disability	Valplast flexible RPDs (n = 30)	NR	NR	MD (SD): 1.2 (1.7) 95% CI, 0.6 to 1.9	< 0.001	
		Acrylic RPDs (n = 30)	NR	NR	MD (SD): −1.2 (1.7) 95% CI, 1.9 to 4.1	< 0.001	
	OHIP-14 domain score: Handicap	Valplast flexible RPDs (n = 30)	NR	NR	MD (SD): 1.0 (2.1) 95% CI, 0.3 to 1.8	0.01	NR
		Acrylic RPDs (n = 30)	NR	NR	MD (SD): 1.0 (1.8) 95% CI, 0.3 to 1.7	0.005	
Sadek and Elawady (2019) ³² Parallel-group RCT	Oral Health-Related Quality of Life questionnaire (patient or caregiver reported, 12 closed-ended questions; lower is better) ^b	Thermopress RPD (n = 14)	Results shared in figure and not extracted	Results shared in figure and not extracted	NR	NR	Significantly lower for Thermopress ^c P value < 0.05
		Vitallium RPD (n = 14)			NR	NR	
		Vitallium RPD with surveyed bridge (n = 14)			NR	NR	
Follow-up: 1 year							
Kumar (2021) ²⁸ Parallel-group RCT	Summary OHIP-14	Polyacetyl RPD (n = 11)	Mean ^{c,d} : 33.27 (6.37)	Mean ^d : 13.63 (2.37)	CI = 15.94 to 23.33	< 0.001	CI = 0.68 to 5.86 P = 0.015

Citation and study design	Outcome name and measurement method	Interventions and number of participants (n)	Baseline	Follow-up	Within-group difference between baseline and follow-up (as reported)	P value for within-group change from baseline	Between-group difference (as reported) and P value
	OHIP-14 domain score: Functional Limitation	Cast metal RPD (n = 11)	Mean ^d : 37.81 (8.80)	Mean ^d : 16.90 (3.36)	CI = 16.14 to 25.67	< 0.001	P = 0.048
		Polyacetyl RPD (n = 11)	Mean ^d : 4.90 (1.97)	Mean ^d : 1.09 (0.53)	NR	0.003	
	OHIP-14 domain score: Physical Pain	Cast metal RPD (n = 11)	Mean ^d : 5.63 (2.46)	Mean ^d : 1.63 (0.80)	NR	0.003	P = 0.429
		Polyacetyl RPD (n = 11)	Mean ^d : 4.81 (1.83)	Mean ^d : 2.09 (0.53)	NR	0.008	
	OHIP-14 domain score: Physical Disability	Cast metal RPD (n = 11)	Mean ^d : 5.90 (2.50)	Mean ^d : 2.54 (0.93)	NR	0.007	P = 0.211
		Polyacetyl RPD (n = 11)	Mean ^d : 5.54 (1.29)	Mean ^d : 2.18 (0.98)	NR	0.003	
	OHIP-14 domain score: Physical Discomfort	Cast metal RPD (n = 11)	Mean ^d : 6.18 (1.72)	Mean ^d : 2.72 (0.78)	NR	0.005	P = 0.490
		Polyacetyl RPD (n = 11)	Mean ^d : 5.90 (1.57)	Mean ^d : 2.54 (0.82)	NR	0.005	
	OHIP-14 domain score: Psychological Disability	Cast metal RPD (n = 11)	Mean ^d : 6.36 (1.74)	Mean ^d : 2.90 (1.13)	NR	0.004	P = 0.373
		Polyacetyl RPD (n = 11)	Mean ^d : 4.63 (1.12)	Mean ^d : 2.45 (0.68)	NR	0.005	
		Cast metal RPD (n = 11)	Mean ^d : 5.09 (1.75)	Mean ^d : 2.81 (0.98)	NR	0.007	
		Polyacetyl RPD (n = 11)	Mean ^d : 4.63 (1.12)	Mean ^d : 2.45 (0.68)	NR	0.005	

Citation and study design	Outcome name and measurement method	Interventions and number of participants (n)	Baseline	Follow-up	Within-group difference between baseline and follow-up (as reported)	P value for within-group change from baseline	Between-group difference (as reported) and P value
	OHIP-14 domain score: Social Disability	Polyacetyl RPD (n = 11)	Mean ^d : 3.72 (1.10)	Mean ^d : 1.63 (0.50)	NR	0.005	P = 0.357
		Cast metal RPD (n = 11)	Mean ^d : 4.54 (1.29)	Mean ^d : 2.09 (1.04)	NR	0.005	
	OHIP-14 domain score: Handicap	Polyacetyl RPD (n = 11)	Mean ^d : 4.27 (1.19)	Mean ^d : 1.63 (0.50)	NR	0.003	P = 0.061
		Cast metal RPD (n = 11)	Mean ^d : 4.81 (1.66)	Mean ^d : 2.18 (0.40)	NR	0.005	

CI = confidence interval; CO = crossover; MD = mean difference; NR = not reported; OHIP-14 = Oral Health Impact Profile; OHRQoL = Oral Health-Related Quality of Life; RCT = randomized controlled trial; RPD = removable partial denture; SD = standard deviation.

^aSubgroup analyses were conducted for age, gender, and socioeconomic status; no significant differences reported based on $P \leq 0.05$ (unclear power to detect differences).

^bQuestions from other tools such as OHIP-49 and GOHAI; 5-point Likert scale with scores 0 (Never) to 4 (Very often).

^cThe time point for the "baseline" measurement for this study is after 1 week follow-up.

^dUnclear if study is reporting standard deviations or standard errors.

Table 14: Summary of Findings by Outcome — Effort for Maintenance in Daily Care

Citation and study design Outcome name and measurement method	Interventions and number of participants (n)	Outcome label	Outcome result n (%)	Between-group difference (as reported)	P value for between-group difference
Follow-up: 1 month					
Akinyamoju et al. (2019) ²⁹ and Akinyamoju et al. (2017) ³⁰ CO-RCT Outcome: Satisfaction with ease of cleaning/ cleanliness Measurement: 100 mm VAS, categorized into 4 groups ^a	Valplast flexible RPDs (n = 30)	Totally dissatisfied	0 (0%)	More satisfied with: flexible RPD: n = 5 acrylic RPD: n = 5 Similarly satisfied with both: n = 20	P value for Wilcoxon signed rank test: 1.00 ^b
		Slightly dissatisfied	0 (0%)		
		Slightly satisfied	0 (0%)		
		Satisfied	30 (100%)		
	Acrylic RPDs (n = 30)	Totally dissatisfied	0.0%		
		Slightly dissatisfied	1 (3.3%)		
		Slightly satisfied	0.0%		
		Satisfied	29 (96.7%)		
Follow-up: 1 year					
Manzon et al. (2019) ³¹ Unclear design Outcome: Prosthesis care Measurement: Patient subjective — 1 question (2 response options)	Valplast flexible RPD (n = 40)			NR	Chi-square P value < 0.001
	Kennedy Class I or II	Difficult	10 (50%)		
		Not difficult	10 (50%)		
	Kennedy Class III or IV	Difficult	13 (65%)		
		Not difficult	7 (35%)		
	Cr-Co RPD (n = 40)				
	Kennedy Class I or II	Difficult	1 (5%)		
		Not difficult	19 (95%)		
	Kennedy Class III or IV	Difficult	0 (0%)		
		Not difficult	20 (100%)		
	PMMA-RPD (n = 40)				
	Kennedy Class I or II	Difficult	2 (10%)		
		Not difficult	18 (90%)		
	Kennedy Class III or IV	Difficult	1 (5%)		
		Not difficult	19 (95%)		

CO = crossover; Cr-Co = chromium-cobalt; NR = not reported; PMMA = polymethyl methacrylate; RCT = randomized controlled trial; RPD = removable partial denture; VAS = visual analogue scale.

^aThe scores from the VAS, a continuous graphical rating scale from 0 to 100 were classified as: totally dissatisfied (0 to 31), slightly dissatisfied (> 31 to 50), slightly satisfied (> 50 to 79), and satisfied (80 to 100).

^bSubgroup analyses were conducted for age, gender, and socioeconomic status; no significant differences reported based on $P \leq 0.05$ (unclear power to detect differences).

Appendix 6: Excluded Economic Evaluation

Please note that this appendix has not been copy-edited.

Table 15: Summary of Excluded Economic Evaluations

Study citation, setting, funding source cost year	Population characteristics Type of analysis, time horizon, perspective	Analytic technique, study design, perspective, time horizon	Intervention and comparator(s)	Outcomes	Summary of outcomes	Main assumptions
Subash et al. (2025) ⁴⁰ Country: India Funding source: Authors reported no funding sources Cost year: 2021 / 2022 (assumed, NR), Indian Rupee ^a	Participants recruited from a single tertiary care centre in India between January 2021 and January 2022 Summary eligibility criteria: Partial edentulism (any Kennedy class), aged 50 to 65 years, unsuitable for, or facing financial constraints for implants or fixed partial dentures. Most lower dentures were the participants' first denture (not stated for upper dentures) and most participants had them for less than a year Number of participants: 42 Cause of edentulism and PROGRESS-Plus criteria: NR ^b	Analytic Technique: not stated (seems to be deterministic analysis) Study design: Clinical evidence based on cross-sectional study; Cost-effective analysis Perspective: NR but health care payer perspective (educational institution in India) Time horizon: 3 months	Intervention: - thermoplastic resin RPDs (n = 14) for 3 months Comparators: - metal clasp–retained RPDs (n = 14) for 3 months - cast partial dentures (n = 14) for 3 months	Cost estimates: Based on the subsidized cost for patients at the educational institution. Included lab charge (base cost) plus a 35% markup to account for overhead costs Outcome: ICER per improvement in OHIP-14 summary scores and patient satisfaction scores ^c	Authors concluded that: “The cost-effectiveness of prosthetic rehabilitation options varies depending on the number of teeth being replaced. [thermoplastic RPDs] are generally more cost-effective for fewer teeth scenarios, whereas [metal clasp–retained RPDs] and [cast partial dentures] tend to be more cost-effective for scenarios involving more teeth” ^d	The ICER was calculated based on the ratio of the difference in cost between interventions and the difference in change of OHIP and patient satisfaction scores ^b

ICER = incremental cost-effectiveness ratio; NR = not reported; OHIP-14 = Oral Health Impact Profile-14; RPD = removable partial denture.

Note: Lower OHIP-14 scores indicate a higher quality of life, whereas higher patient satisfaction scores indicate higher satisfaction.

^aCost-year not reported. Assumption made based on the clinical study recruitment timing on which the clinical effectiveness data are based.

^bThe main PROGRESS-Plus criteria include place of residence, race, ethnicity, culture, language, occupation, gender, sex, religion, education, socioeconomic status, social capital, personal characteristics associated with discrimination (e.g., age, disability), features of relationships, and time-dependent relationships.²

^cThe authors also report the calculation of the direct cost of achieving the clinically minimally important difference in OHIP-14 summary score with each RPD treatment but do not report either the minimally important difference or the results of the direct cost to achieve this.

^dEdited to more clearly reference relevant intervention groups (study report used inconsistent terminology throughout).



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