ISSN :2584-2706 DOI: https://doi.org/10.67317/IJMSRT26NOV082

The "Whole-Pathway" Cost-Effectiveness of Minimum Intervention Dentistry (MID) Compared to Traditional Surgical-Restorative Models in Primary Care Settings: A Clinical and Health-Economic Review

Dr. Althaaf Khan, BDS (SMU), Assoc Fcgdent (UK)
Private Practice, South Africa

Corresponding Author

Abstract

Objective: Minimum Intervention Dentistry (MID) shifts caries management from surgical excision toward biological disease control and tissue preservation. While individual MID modalities—such as silver diamine fluoride (SDF), atraumatic restorative treatment (ART), the Hall Technique, and selective caries removal—demonstrate favorable standalone cost-effectiveness, evidence synthesizing the economic performance of an integrated "whole-pathway" MID care model in primary dental settings remains fragmented. This review evaluates the clinical and health-economic outcomes of implementing comprehensive, longitudinal MID care pathways compared to traditional surgical-restorative models.

Methodology: A structured narrative and health-economic synthesis of peer-reviewed randomized controlled trials, longitudinal practice-based cohorts, and Markov or decision-analytic economic evaluations was conducted. Studies assessing multi-domain MID pathways—encompassing risk-stratified diagnosis, non-operative biofilm and dietary control, micro-invasive sealing, and minimally invasive restoration—against conventional "drill-and-fill" primary care were analyzed for clinical effectiveness, incremental cost-effectiveness ratios (ICERs), and net monetary benefit (NMB).

Major Findings: Longitudinal whole-pathway evaluations—including the Australian Caries Management System, the Dutch Non-Operative Caries Treatment and Prevention trial, and the United Kingdom FiCTION trial—demonstrate that structured MID pathways reduce restorative re-intervention rates, maintain pulp vitality, and avoid costly tertiary referrals such as dental general anaesthesia. Although upfront diagnostic and behavioral counseling time increases initial consultation expenditure, longitudinal models achieve favorable ICERs and superior NMB, particularly among high-caries-risk populations and resource-constrained settings such as South Africa.

Conclusion: Whole-pathway MID is clinically effective and economically sustainable over medium-to-long-term horizons, provided primary care reimbursement reforms align financial incentives with preventive surveillance rather than surgical volume.

Keywords: *Minimum Intervention Dentistry; Cost-Effectiveness Analysis; Primary Dental Care; Dental Caries;Care Pathways; Health Economics.*

I. INTRODUCTION

Untreated dental caries remains the most prevalent non-communicable condition globally, affecting over two billion people in their permanent dentition and imposing substantial direct treatment expenditure alongside indirect productivity losses across high-, middle-, and low-income nations **[1]**. For more than a century, primary dental care has been dominated by a mechanistic, surgical-restorative paradigm rooted in G.V. Black's principles of "extension for prevention," wherein carious lesions are managed predominantly through complete mechanical excavation and placement of intra-coronal restorations **[2]**. However, longitudinal clinical evidence demonstrates that surgical excision fails to address the underlying ecological biofilm dysbiosis driving caries progression, instead initiating Elderton's "restorative death spiral," in which each successive restoration replacement enlarges cavity dimensions, compromises pulpal integrity, and culminates in endodontic therapy, full-coverage prosthetics, or extraction **[2]**.

ISSN :2584-2706 DOI: https://doi.org/10.67317/IJMSRT26NOV082

In response to these biological and economic limitations, contemporary cariology has coalesced around Minimum Intervention Dentistry (MID)—increasingly operationalized as the Minimal Intervention Oral Care (MIOC) framework **[3]**,**[4]**. Endorsed by the FDI World Dental Federation and international consensus consortia such as the International Caries Consensus Collaboration (ICCC) and CariesCare International, MID conceptualizes dental caries as a chronic, behaviorally mediated biofilm disease manageable through four interlinked clinical domains: (1) early lesion detection, staging, and individualized caries risk assessment; (2) primary and secondary non-operative prevention through biofilm disruption, fluoride remineralization, and dietary sugar modulation; (3) micro-invasive and minimally invasive tooth-preserving interventions; and (4) risk-adjusted longitudinal recall and active surveillance **[3]**,**[4]**,**[5]**.

A substantial body of clinical trials and health-economic evaluations has examined individual MID techniques in isolation, confirming high clinical efficacy and favorable cost-effectiveness for 38% silver diamine fluoride (SDF) in arresting dentinal caries **[6]**, the Hall Technique (HT) in sealing carious primary molars without local anaesthesia or tooth preparation **[7]**, atraumatic restorative treatment (ART), and selective carious tissue removal. Nevertheless, recent scoping reviews highlight a critical translational gap: primary care practitioners frequently adopt single MID techniques on an ad-hoc basis rather than restructuring clinical workflows around an integrated, longitudinal MID care pathway **[8]**. Evaluating isolated procedures overlooks compounding pathway effects, including avoided downstream re-restorations, altered recall intervals, workforce delegation, and shifts in consultation duration. The objective of this review is therefore to synthesize existing clinical and health-economic evidence evaluating complete "whole-pathway" MID care models compared to traditional surgical-restorative care in primary dental settings.

II. MATERIALS AND METHODS

Study Design and Search Strategy: A structured narrative and health-economic literature synthesis was conducted to identify comparative clinical and economic evaluations of multi-component MID pathways versus conventional surgical-restorative care in primary dental settings. Comprehensive literature searches were executed across PubMed/MEDLINE, Scopus, Web of Science, and the Cochrane Library up to October 2026. Search strings combined controlled vocabulary and free-text terms across three conceptual blocks: (1) *caries management philosophy* ("minimum intervention dentistry," "minimal intervention oral care," "non-operative caries treatment," "caries management system," "biological caries management," "CariesCare"); (2) *care setting* ("primary dental care," "general dental practice," "community oral health," "public dental service"); and (3) *economic and clinical outcomes* ("cost-effectiveness," "cost-utility," "cost-benefit," "economic evaluation," "Markov model," "incremental cost-effectiveness ratio," "net monetary benefit"). Reference lists of key consensus statements and systematic reviews were hand-searched to ensure exhaustive coverage.

Eligibility Criteria: Studies were selected for inclusion according to predefined methodological and clinical parameters:

- **Population and Setting:** Pediatric, adolescent, or adult patients receiving primary oral healthcare in general dental practices, school-based clinics, or public primary care facilities.
- **Intervention:** Longitudinal, multi-domain MID care pathways integrating at least two core MIOC pillars (e.g., structured caries risk assessment, risk-stratified non-operative preventive regimens, active surveillance, and biologically driven micro-invasive or minimally invasive restorative protocols), supplemented by foundational economic models ofcore component MID modalities embedded within primary care pathways.
- **Comparator:** Traditional surgical-restorative ("drill-and-fill") primary care characterized by routine complete caries excavation, standard restorative thresholds, and uniform recall intervals.
- **Outcomes and Study Types:** Randomized controlled trials (RCTs), longitudinal practice-based cohort studies, and model-based economic evaluations (Markov or decision-tree analyses) reporting both clinical endpoints (decayed, missing, and filled teeth/surfaces [DMFT/DMFS] increments, restorative events avoided, pulp vitality, dental pain/infection episodes, or general anaesthesia referrals) and economic metrics (direct/indirect costs, ICERs, or NMB). Opinion pieces lacking empirical or modeled economic data were excluded.

Data Extraction and Analytical Synthesis: Extracted variables included study jurisdiction, healthcare financing context, cohort demographics, time horizon, perspective (healthcare payer versus societal), discount rates, clinical effectiveness outcomes, and incremental economic metrics. Because heterogeneity in currency units, fee schedules, clinical endpoints, and time horizons precluded statistical meta-analysis, findings were synthesized thematically across pathway architecture, longitudinal trial performance, component synergies, and health-system implementation determinants.

Ethical Approvals and Informed Consent: This review synthesized data exclusively from previously published, peer-reviewed studies and publicly accessible health-economic models. No primary data collection involving human participants, patient records, or animal subjects was undertaken; consequently, institutional review board ethical approval and informed consent were not applicable.

ISSN :2584-2706 DOI: https://doi.org/10.67317/IJMSRT26NOV082

III. RESULTS AND DISCUSSION

3.1.Conceptual Architecture: Whole-Pathway MID vs. Traditional Surgical-Restorative Models

A foundational finding across the cariology and health-economics literature is that "whole-pathway" MID operates as a complex, longitudinal healthcare intervention rather than a mere substitution of restorative materials **[5],[8]**. Under traditional primary care models, diagnostic effort focuses predominantly on detecting cavitated lesions requiring immediate operative restoration, with uniform six-month recall schedules regardless of individual disease susceptibility. Conversely, structured whole-pathway frameworks—such as Caries Management by Risk Assessment (CAMBRA) **[9]**, the Australian Caries Management System (CMS) **[10]**, and the CariesCare International 4D system **[5]**—reallocate clinical resources upstream toward diagnostic staging, behavioral risk modification, and non-operative lesion arrest (Table 1).

Table 1. Structural and Resource-Allocation Comparison Between Traditional Surgical-Restorative Care and Whole-Pathway Minimum Intervention Dentistry (MID) in Primary Care

Care Pathway Domain	Traditional Surgical-Restorative Model	Whole-Pathway MID Model (MIOC / 4D Framework)
1 . Detection & Risk Stratification	Binary visual-tactile screening focused on cavitation; ad-hoc bitewing radiographs; unstandardized risk documentation.	Staged lesion severity and activity assessment (e.g., ICDAS/CariesCare); formal Caries Risk Assessment (low, moderate, high/extreme) guiding all downstream care **[5]**,**[9]**.
2. Primary & Secondary Prevention	Generic oral hygiene instruction delivered incidentally; minimal dedicated chairside time for behavioral counseling or topical therapeutics.	Structured motivational interviewing, dietary sugar modulation, high-fluoride home regimens, professional fluoride varnish, resin infiltration, and therapeutic fissure sealants **[3]**,**[9]**.
3. Operative & Micro-Invasive Thresholds	Early surgical intervention at enamel-dentine junction; complete non-selective carious tissue removal; frequent local anaesthesia and rotary instrumentation.	Non-operative arrest (SDF, biofilm control) for non-cleansable or primary lesions; biological sealing (Hall Technique); selective removal to soft/firm dentine for deep vital lesions **[4]**,**[7]**.
4. Longitudinal Recall & Maintenance	Fixed 6-month recall intervals; defective restorations routinely replaced in full, expanding cavity size over time **[2]**.	Risk-adjusted recall intervals (3–1 2 months); active lesion monitoring; refurbishment, resealing, and targeted repair of defective restoration margins **[3]**,**[5]**.
Care Pathway Domain	Traditional Surgical-Restorative Model	Whole-Pathway MID Model (MIOC / 4D Framework)
Economic Cost Profile	Lower initial diagnostic outlay, followed by high, recurring lifelong expenditure from repeat restorations, endodontics, crowns, and extractions.	Higher front-loaded expenditure in Years 1 –2 for diagnostic assessment, preventive coaching, and topical agents, offset by declining cumulative restorative costs [11], [13].

ISSN :2584-2706 DOI: https://doi.org/10.67317/IJMSRT26NOV082

3.2. Empirical Evidence from Longitudinal Whole-Pathway Trials and Economic Models

Four landmark empirical and modeling programs provide the most rigorous evidence on whole-pathway MID cost-effectiveness in primary care settings (Table 2). In Australia, the Monitor Practice Programme evaluated the Caries Management System (CMS)—a structured non-invasive protocol combining individualized risk assessment, plaque control coaching, topical fluoride varnish, and active radiographic monitoring of non-cavitated approximal lesions—across 22 private general dental practices **[10]**. Over the initial 3-year cluster-randomized trial, CMS practices achieved a 40.3% reduction in caries incidence and significantly lower DMFT increments compared to standard care **[10],[11]**. Subsequent individual-patient Markov modeling over a lifetime horizon demonstrated an incremental cost per DMFT avoided of AUD 1,795.06, with cost-effectiveness heavily concentrated among high-caries-risk individuals **[11]**. Crucially, a 4-year post-trial follow-up (7 years total) confirmed that practices adhering to CMS protocols sustained lower restorative event rates (mean 5.46 vs. 7.62 restorative events), yielding a per-protocol ICER of AUD 964 per restorative event avoided at 7 years and AUD 1,980 (USD 1,409) over a patient's lifetime—well below the estimated lifetime societal cost of a single avoidable restoration **[12]**.

Parallel longitudinal evidence from the Netherlands reinforces this front-loaded investment dynamic. Vermaire et al. conducted a 3-year randomized controlled economic evaluation comparing the Non-Operative Caries Treatment and Prevention (NOCTP) pathway (adapted from the Danish Nexø model, emphasizing parent-child plaque-control training and individualized recall intervals) against increased professional fluoride applications (IPFA) and standard care in 6-year-old children **[13]**. While NOCTP incurred higher initial investments during Year 1 due to intensive behavioral coaching, annual costs declined sharply in Year 2 and equaled standard care by Year 3, while achieving the lowest DMFS increment (mean 0.15 vs. 0.47 in standard care) and establishing NOCTP as the economically dominant strategy from both healthcare and societal perspectives **[13]**.

In the United Kingdom, the pragmatic multi-center FiCTION (Filling Children's Teeth: Indicated or Not?) trial randomized 1,144 children aged 3–7 years across 72 primary dental practices to three whole-pathway strategies over a median follow-up of 33.8 months: Conventional restorative management with best-practice prevention (C+P), Biological management with prevention (B+P, utilizing Hall Technique crowns, selective caries removal, and fissure sealants), and Best-Practice Prevention Alone (PA) **[14]**. Economic evaluation of 1,058 children revealed an average 36-month management cost of £230 per child, with PA being the least costly (£19 less than B+P) and C+P strictly dominated because it incurred higher operative costs while delivering slightly worse clinical outcomes than B+P . At willingness-to-pay thresholds of £330 per incidence and £130 per episode of dental pain and/or infection avoided, the Biological + Prevention (B+P) pathway exhibited the highest probability of cost-effectiveness .**[14][14]**

In resource-constrained primary care contexts, public-sector economic modeling from South Africa illustrates the macroeconomic value of MID pathways where water fluoridation is absent and over 80% of childhood caries remains untreated **[15]**. Boachie et al. modeled five population-level caries management strategies for South African schoolchildren aged 5–15 years over a 10-year horizon using a Markov cohort framework **[15]**. Atraumatic Restorative Treatment (ART) programs averted 144,035 DMFT at a total program cost of ZAR 45 million, generating the highest Net Monetary Benefit (NMB) of ZAR 5.55 billion and a 75% probability of being the most cost-effective strategy across willingness-to-pay thresholds, outperforming fissure sealants (NMB ZAR 3.81 billion), supervised toothbrushing (ZAR 2.78 billion), sugar reduction (ZAR 2.45 billion), and acidulated phosphate fluoride gel (ZAR 1.56 billion) **[15]**.

Table 2. Summary of Key Comparative Health-Economic Evaluations of Whole-Pathway and Pathway-Embedded MID Strategies in Primary Care

Study & Setting	Pathway / Strategy Evaluated	Design & Horizon	Primary Clinical Outcome	Key Health-Economic Findings
Curtis et al. (2011); Warren et al. (2010, 2016) Australia (Private Primary Care) **[10],[11], [12]**	Caries Management System (CMS) vs. Standard Restorative Care	Cluster RCT (3 yrs) + 4-yr post-trial follow-up & Markov model (Lifetime)	40.3% reduction in caries incidence; 5.46 vs. 7.62 restorative events over 7 years.	Per-protocol ICER: AUD 964 per restorative event avoided (7 yrs) and AUD 1,980 (lifetime); highest cost-effectiveness in high-risk patients.
Vermaire et al. (2014) Netherlands (Primary Pediatric Care)	Non-Operative Caries Treatment & Prevention (NOCTP) vs. IPFA & Standard Care	3-arm RCT (3 yrs; N = 1 79 children aged 6 yrs)	Lowest DMFS increment in NOCTP (0.1 5) vs. IPFA (0.34) and Standard Care (0.47).	Higher Year 1 coaching cost declined by Year 2 and equaled control by Year 3; NOCTP dominant from societal

ISSN :2584-2706 DOI: https://doi.org/10.67317/IJMSRT26NOV082

[13]				and payer perspectives.
Study & Setting	Pathway / Strategy Evaluated	Design & Horizon	Primary Clinical Outcome	Key Health-Economic Findings
Homer et al.	FiCTION Trial:	Multi-center	No significant	C+P dominated by
(2020)	Biological +	RCT (Up to 36	difference in	B+P; B+P had highest
United Kingdom	Prevention (B+P) vs.	mos; N =	pain/infection	probability of cost-
(72 General Dental	Prevention Alone	1 ,058 children	episodes; fewer	effectiveness at WTP
Practices) [14]	(PA) vs.	aged 3–7 yrs)	operative visits in PA	thresholds (£330 per
	Conventional +		and biological sealing	incidence / £1 30 per
	Prevention (C+P)		in B+P.	episode avoided).
Boachie et al.	ART, Fissure	Markov cohort	ART averted 1 44,035	ART yielded highest
(2023)	Sealants,	model (1 0 yrs;	DMFT; Fissure	Net Monetary Benefit
South Africa (Public	Toothbrushing,	learners aged	Sealants averted	(ZAR 5.55 billion; 0.75
School Primary	Sugar Reduction,	5–1 5 yrs)	1 00,024 DMFT.	probability of cost-
Care) [15]	APF-Gel vs. Status			effectiveness across
	Quo			WTP thresholds).
Nguyen et al.	Silver Diamine	Decision-tree	Dental general	Dominant ICER (cost-
(2022)	Fluoride (SDF)	model with	anaesthesia (DGA)	saving and clinically

ISSN :2584-2706 DOI: https://doi.org/10.67317/IJMSRT26NOV082

Australia (Public	triage protocol vs.	PSA (Children	referral reduced from	superior; 74.8%–1 00%
Primary/Commu nity	Standard Care	aged 2–1 0 yrs)	34.6% to 1 2.4%.	probability of cost-
Care) [16]	referral			effectiveness) by
				diverting tertiary DGA.
Schwendicke et	Hall Technique (HT)	Practice-based	HT retained primary	5-yr cumulative cost:
al. (2013, 2016,	& One-Step	RCT (5 yrs) &	molars longer with	£32 (HT) vs. £49
2019)	Selective Caries	Monte Carlo	fewer pulpal	(conventional); lifetime
Germany & UK	Removal vs.	Markov	complications;	deep-lesion cost: €265
(Primary Dental	Complete	models	selective removal	(one-step selective) vs.
Settings) [17],[1 8],	Excavation /	(Lifetime)	preserved pulp vitality	€398 (complete
[19]	Pulpotomy		(41 .0 vs. 31 .0 yrs).	excavation).

ISSN :2584-2706 DOI: https://doi.org/10.67317/IJMSRT26NOV082

3.3. Component-Level Synergies Within a Unified Care Pathway

Synthesizing component-level economic evaluations alongside whole-pathway trials reveals why individual MID techniques generate amplified economic returns when sequenced within a risk-stratified pathway. First, integrating 38% SDF at the primary care triage stage acts as an immediate biological circuit-breaker for active cavitated lesions in young or anxious patients **[6]**,**[16]**. In an Australian public-sector decision-tree analysis, Nguyen et al. demonstrated that embedding an SDF arrest protocol prior to specialist referral reduced dental general anaesthesia (DGA) utilization from 34.6% to 12.4%, producing a dominant (cost-saving) ICER while mitigating perioperative morbidity and lengthy hospital waiting lists **[16]**.

Second, when cavitated lesions require physical sealing or restoration to restore cleansability and occlusal function, minimally invasive operative protocols markedly outperform conventional complete excavation. Five-year practice-based trial data modeled by Schwendicke et al. showed that the Hall Technique in primary molars achieved superior restoration survival and lower cumulative treatment costs (£32 vs. £49 per tooth) than conventional intra-coronal restorations **[17]**. Similarly, for deep dentinal lesions in permanent teeth, Monte Carlo Markov simulations demonstrated that one-step selective caries removal to soft dentine retained teeth (53.5 vs. 49.5 years) and preserved pulp vitality (41.0 vs. 31.0 years) at substantially lower lifetime cost (€265 vs. €398, a 33% cost reduction) compared to complete non-selective excavation, largely by preventing iatrogenic pulp exposures and subsequent root canal therapy . Importantly, Schwendicke et al. also demonstrated that risk-based immediate pulpotomy for asymptomatic deep lesions is economically inferior to biological sealing approaches because clinicians cannot reliably predict pulpal complications pre-operatively . Thus, whole-pathway efficiency arises from staged escalation: arresting early and moderate lesions non-operatively, sealing non-cleansable cavities biologically, and reserving invasive operative care strictly for structural failures.**[18]**|**[19]**

3.4.Health-System Implementation Barriers, Workforce Skill-Mix, and Reimbursement Reform

Despite robust clinical and economic justification, translating whole-pathway MID into routine primary care faces persistent structural barriers **[8]**,**[20]**. Foremost among these is payment model misalignment. Predominant fee-for-service (FFS) remuneration systems in both private and public-private primary care reward irreversible surgical procedures (e.g., multi-surface restorations, endodontics, and extractions) at substantially higher tariffs per unit of chairside time than diagnostic risk profiling, dietary counseling, fluoride varnish application, or active lesion surveillance **[8]**,**[12]**. In the Australian CMS trial, practitioner adherence to non-invasive protocols attenuated after trial subsidies ended whenever FFS schedules penalized longer preventive consultations **[12]**. Transitioning toward blended payment models—combining risk-adjusted capitation, bundled preventive care packages, and explicit billing codes for caries risk assessment and non-operative lesion arrest—is therefore essential to make whole-pathway MID financially viable for primary care clinics **[5]**,**[20]**.

Workforce optimization and educational reform represent equally critical levers. Whole-pathway MID relies heavily on longitudinal behavioral coaching, topical preventive therapy, and atraumatic procedures that can be safely and cost-effectively delivered by mid-level oral healthcare providers, including oral hygienists and dental therapists, working collaboratively within team-based primary care **[8]**,**[20]**. In countries such as South Africa, where a dual-tiered health system serves roughly 85% of the population through under-resourced public clinics alongside a predominantly FFS private sector **[15]**, empowering dental therapists and oral hygienists to lead school- and clinic-based MID pathways (integrating ART, SDF, and fissure sealants) offers an immediate, scalable mechanism to reduce restorative backlogs and out-of-pocket household expenditure. Simultaneously, undergraduate dental curricula and continuing professional development must shift clinical competency assessments away from numerical surgical restoration quotas toward longitudinal caries management and tissue preservation outcomes **[4]**,**[8]**.

Limitations of Current Evidence: Several methodological constraints warrant consideration. Most whole-pathway RCTs have been conducted in high-income countries with universal or subsidized dental coverage (Australia, the Netherlands, and the United Kingdom) over 3- to 7-year horizons, necessitating Markov extrapolation to capture lifetime tooth retention benefits. Additionally, few economic evaluations incorporate broader societal savings—such as reduced caregiver work absenteeism, decreased dental anxiety, and lower environmental mercury and plastic waste burdens—meaning current ICERs likely underestimate the true societal value of whole-pathway MID.

IV. CONCLUSION

Evaluating Minimum Intervention Dentistry across an entire longitudinal care pathway, rather than as isolated clinical procedures, demonstrates clear clinical and health-economic superiority over traditional surgical-restorative models in primary dental care. While comprehensive MID pathways require higher front-loaded investments in diagnostic risk stratification, behavioral counseling, and preventive therapeutics, these expenditures are offset over medium- and long-term horizons by significant reductions in caries incidence, avoided repeat restorations, preserved pulp vitality, and diverted hospital general anaesthesia referrals. Realizing the full economic dividend of whole-pathway MID in both private and public primary care settings requires coordinated policy action: reforming fee-for-service reimbursement schedules to reward preventive surveillance and non-operative arrest, utilizing the full skill-mix of the oral healthcare team, and embedding biological caries management principles across dental education.

V. ACKNOWLEDGEMENTS

The author acknowledges the international cariology, dental public health, and health-economics research communities whose longitudinal clinical trials and consensus frameworks continue to advance evidence-based, tissue-preserving oral healthcare in primary care settings.

Funding Statement

ISSN :2584-2706 DOI: https://doi.org/10.67317/IJMSRT26NOV082

This research received no specific grant, financial support, or commercial sponsorship from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The author declares no financial, professional, institutional, or personal conflicts of interest that could potentially influence the design, interpretation, or reporting of this review article.

REFERENCES

[1]. Peres MA, Macpherson LMD, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: a global public health challenge. Lancet. 2019;394(10194):249-260.
[2]. Elderton RJ. Clinical studies concerning re-restoration of teeth. Adv Dent Res. 1990;4:4-9.
[3]. Frencken JE, Peters MC, Manton DJ, Leal SC, Gordan VV, Eden E. Minimal intervention dentistry for managing dental caries - a review: report of a FDI task group. Int Dent J. 2012;62(5):223-243.
[4]. Banerjee A, Frencken JE, Schwendicke F, Innes NPT. Contemporary operative caries management: consensus recommendations on minimally invasive caries removal. Br Dent J. 2017;223(3):215-222.
[5]. Pitts NB, Banerjee A, Mazevet ME, Goffin G, Martignon S. From 'ICDAS' to 'CariesCare International': the 20-year journey building international consensus to take caries evidence into clinical practice. Br Dent J. 2021;231(12):769-774.
[6]. Gao SS, Zhao IS, Hiraishi N, Duangthip D, Mei ML, Lo ECM, et al. Clinical trials of silver diamine fluoride in arresting caries among children: a systematic review. JDR Clin Trans Res. 2016;1(3):201-210.
[7]. Innes NP, Evans DJ, Stirrups DR. The Hall Technique; a randomized controlled clinical trial of a novel method of managing carious primary molars in general dental practice: acceptability of the technique and outcomes at 23 months. BMC Oral Health. 2007;7:18.
[8]. Dawett B, Deery C, Banerjee A, Papaioannou D, Marshman Z. A scoping literature review on minimum intervention dentistry for children with dental caries. Br Dent J. 2022 Mar 4. doi: 10.1038/s41415-022-4038-8.
[9]. Featherstone JDB, Crystal YO, Alston P, Chaffee BW, Doméjean S, Rechmann P, et al. Evidence-based caries management for all ages-practical guidelines. Front Oral Health. 2021;2:657518.
[10]. Curtis B, Warren E, Pollicino C, Evans RW, Schwarz E, Sbaraini A. The Monitor Practice Programme: is non-invasive management of dental caries in private practice cost-effective? Aust Dent J. 2011;56(1):48-55.
[11]. Warren E, Pollicino C, Curtis B, Evans W, Sbaraini A, Schwarz E. Modeling the long-term cost-effectiveness of the Caries Management System in an Australian population. Value Health. 2010;13(6):750-760.
[12]. Warren E, Curtis BH, Jia N, Evans RW. The Caries Management System: updating cost-effectiveness with 4-year posttrial data. Int J Technol Assess Health Care. 2016;32(3):107-115.
[13]. Vermaire JH, van Loveren C, Brouwer WBF, Krol M. Value for money: economic evaluation of two different caries prevention programmes compared with standard care in a randomized controlled trial. Caries Res. 2014;48(3):244-253.
[14]. Homer T, Maguire A, Douglas GVA, Innes NP, Clarkson JE, Wilson N, et al. Cost-effectiveness of child caries management: a randomised controlled trial (FiCTION trial). BMC Oral Health. 2020;20(1):45.
[15]. Boachie MK, Molete M, Hofman K, Thsehla E. Cost-effectiveness of dental caries prevention strategies in South African schools. BMC Oral Health. 2023;23(1):814.
[16]. Nguyen TM, Tonmukayakul U, Hall M, Calache H. Cost-effectiveness analysis of silver diamine fluoride to divert dental general anaesthesia compared to standard care. Aust Dent J. 2022;67(4):352-361.
[17]. Schwendicke F, Krois J, Robertson M, Splieth C, Santamaria R, Innes N. Cost-effectiveness of the Hall Technique in a randomized trial. J Dent Res. 2019;98(1):61-67.
[18]. Schwendicke F, Stolpe M, Meyer-Lueckel H, Paris S, Dörfer CE. Cost-effectiveness of one- and two-step incomplete and complete excavations. J Dent Res. 2013;92(10):880-887.
[19]. Schwendicke F, Stolpe M, Innes N. Conventional treatment, Hall Technique or immediate pulpotomy for carious primary molars: a cost-effectiveness analysis. Int Endod J. 2016;49(9):817-826.
[20]. Innes NP, Manton DJ. Minimum intervention children's dentistry - the starting point for a lifetime of oral health.
[21]. Br Dent J. 2017;223(3):205-213.