




Labels and descriptions of dental behaviour support techniques: A scoping review of clinical practice guidelines

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Abstract

Introduction: There is no agreed taxonomy of the techniques used to support patients to receive professional oral healthcare. This lack of specification leads to imprecision in describing, understanding, teaching and implementing behaviour support techniques in dentistry (DBS).

Methods: This review aims to identify the labels and associated descriptors used by practitioners to describe DBS techniques, as a first step in developing a shared terminology for DBS techniques. Following registration of a protocol, a scoping review limited to Clinical Practice Guidelines only was undertaken to identify the labels and descriptors used to refer to DBS techniques.

Results: From 5317 screened records, 30 were included, generating a list of 51 distinct DBS techniques. General anaesthesia was the most commonly reported DBS ($n=21$). This review also explores what term is given to DBS techniques as a group (*Behaviour management* was most commonly used ($n=8$)) and how these techniques were categorized (mainly distinguishing between pharmacological and non-pharmacological).

Conclusions: This is the first attempt to generate a list of techniques that can be selected for patients and marks an initial step in future efforts at agreeing and categorizing these techniques into an accepted taxonomy, with all the benefits this brings to research, education, practice and patients.

KEYWORDS

anxiety, behavioral science, special care

1 | INTRODUCTION

Professional oral healthcare is essential to maintain health and function and prevent or treat pain and infection.¹ However, the process of professional oral healthcare possesses inherent challenges, which can stretch coping capacity for many, and be an outright ordeal for others: especially those who are vulnerable, traumatized, anxious, disabled and at extremes of age.^{2,3} When some people in these groups experience professional oral healthcare, harm may arise through reluctance to engage with treatment, a needlessly more difficult experience of dentistry, a build-up of untreated disease, poor treatment outcomes and deep cognitive and behavioural sequelae.^{4,5} Efforts to address this problem have propagated a range of pharmacological, psychological and other techniques that patients can benefit from during professional oral healthcare to make the experience and outcomes of dentistry better. Together, these techniques are often termed *Behaviour management* techniques and range in extent from *general anaesthesia* to simple *Distraction*, with much in between.⁶

The term Dental Behaviour Support (DBS), as first suggested by Lyons,⁷ was used to describe such techniques and interventions applied during professional oral healthcare. For this review, *DBS interventions* were defined as any passive or active interaction with the patient, using specific techniques, to support patients to receive safe, effective and acceptable professional oral healthcare. *DBS techniques* were defined as the smallest active component of a DBS intervention that on its own has the potential to support the patient to receive professional oral healthcare. Borrowing from the definitions applied in behaviour change, the defining features of a DBS technique are that they are observable; replicable; irreducible; a component of a DBS intervention; a postulated active ingredient within the intervention.⁸

Despite their ubiquity, DBS techniques are poorly understood, and variously applied, by those who use them.⁹ This is hardly surprising when there is no consensus on what these techniques actually involve, how they are implemented, what they should be called collectively, and the mechanisms by which they work, if indeed they do.¹⁰ In the absence of such agreement, many dental teams have developed means to support patients themselves through creative processes of trial and error.^{11,12}

When reviewed, the literature has found limited and often inconsistent evidence to support the use of the broad range of what may be considered DBS techniques in specific populations.¹³⁻¹⁷ While there are pockets of well-defined and evidenced DBS techniques within specific fields of behaviour science such as techniques based on CBT^{18,19} and Applied Behaviour Analysis (ABA),²⁰ the vast range of techniques utilized across dentistry combine as a mix of conceptually sound, defined, empirical techniques with others that lack precision and rigour in theoretical understanding, conceptualisation, application and evidence-base. This has important implications for selection, application, evidencing and teaching of all techniques.

One major barrier to progress in this field comes from a lack of agreement on terminology. A lack of specification weakens the

evaluation and implementation of DBS interventions. This promotes colloquialisms within silos and across subspecialties within dentistry and behavioural sciences, when they need not exist. Difficulties therefore arise such as the *jingle-jangle fallacy*, whereby a single technique may be erroneously considered as two distinct techniques because it is given two or more names and multiple techniques are erroneously considered a single technique as they are given the same name.²¹ This may lead to inconsistent or even contradictory evidence for specific techniques, when in fact it is definitions that are inconsistent and contradictory.²² This results in confusion around terminology, which impairs a dental team's ability to understand, share and improve practice.

Of course, such taxonomical issues are not unique to dentistry. They arise across fields of behavioural science, such as implementation science, behaviour change and self-management of disease, where the response has been to generate consensus on the definition of various behavioural techniques, thereby bringing significant advances through shared language.²³⁻²⁵ Dentistry has much to gain from such approaches. A standardized language regarding DBS will enable accurate definition, description and, as is necessary with any extensive list, a means of grouping techniques in a sensible and consistent manner. Accurate description will allow specification of interventions in research and implementation. Ultimately, this would allow the dental profession to disseminate evidence-based techniques in clinical practice and research, ensuring access and addressing inequalities.

The BeSiDe group (Behaviour Support in Dentistry) was formed to improve the practice, teaching and science of Dental Behaviour Support by first developing a universal theory-based, classification framework of techniques from which to develop clinical practice, inform research methods and develop educational resources, thereby improving access to, and experience of, appropriate professional oral healthcare for all.¹⁰

This review aims to identify and compile the labels and descriptors used in identified DBS techniques in clinical practice guidelines into a prototype list, as a first step in developing a shared terminology. [Supplemental Material](#) offers an overview of the overall design. This prototype list will then be validated through expert consensus and sorted theoretically in a further study. This is thus the first of two integrated studies, loosely based on a process used to hierarchically relate terminology in the field of health-related Behaviour Change.²⁶ The specific questions of this review were as follows:

- Q1. What labels and descriptors are applied to DBS techniques in Clinical Practice Guidelines (CPGs)?
- Q2. What term is given to Dental Behaviour Support in CPGs;
- Q3. How are DBS techniques categorized in CPGs;
- Q4. Where stated, what theoretical basis is given for the DBS?

2 | METHODS

This scoping review was limited to Clinical Practice Guidelines (CPGs) only and followed Joanna Briggs Institute (JBI) methods.²⁷ A

protocol was registered prospectively and followed without deviation.²⁸ The search strategy adopted three standard steps²⁷ including Medline (Ovid) and Embase, plus an extensive grey literature review. A search strategy was devised in tandem with an information retrieval expert. Titles and abstracts/first line descriptions were scraped and transferred into a management system.²⁹ The review spanned from Oct 2021 to Feb 2022. Searches were not re-run.

Selectors were calibrated on 25 titles/abstracts prior to data collection. Titles and/or abstracts were screened independently in pairs, applying inclusion criteria. Full texts of these potentially eligible studies were retrieved and independently assessed for eligibility by two review team members. Articles with unclear status were resolved through discussion. Reason for exclusion was recorded from this stage only.

Selectors at both title/abstract and full text review stages applied eligibility criteria according to PICAR acronym (Population; Indication; Content; Attributes; Recommendation).³⁰ Data were extracted by one reviewer and verified by another, adopting a standardized form (piloted during training exercises). Discrepancies were resolved through discussion. Missing data were not requested from authors. Neither risk of bias nor strength of cumulative evidence were assessed.

Raw data were next sorted and refined by five authors leading to a prototype list for further analyses and agreement. This emergent list was sorted with techniques aggregated by similarity into a prototype list, ready for the agreement aspect of this research project. Data were sorted to answer secondary questions. Subgroup- and meta-analyses were not undertaken. Further detail on search restrictions and rationale, data extraction and sorting can be seen in [Supplemental Material](#).

3 | RESULTS

3.1 | Study selection

Database searching identified 7082 records for screening, with an additional 337 coming from grey literature, and 38 from reference lists. Following duplicate removal ($n=2140$), 5317 titles and abstracts were screened leading to 72 records progressing to full text review. A further 40 records were excluded, leading to the inclusion of 30 CPGs ([Figure 1](#)).

3.2 | CPG characteristics

As per [Supplemental file 1](#), 22 were considered CPGs, two were standards of practice,^{31,32} two recommendations,^{33,34} two policy statements,^{35,36} one consensus statement³⁷ and one review of CPGs.³⁸ Twelve of these CPGs were from North America,^{33,35,39–47} seven from the UK,^{31,48–53} four from Europe,^{6,37,54,55} three from Australia and New Zealand,^{32,36,56} two from Asia^{38,57} and two were international.^{34,55} Eighteen separate organizations led the development of these CPGs and all were published by dental professional

organizations apart from: three published by condition-specific organizations,^{34,55,58} two by anaesthetic professional organizations,^{51,56} two by a guideline publishing group^{52,53} and one by a regulatory body.³² Ten were published by the American Association of Paediatric Dentistry (AAPD). Regarding target populations, thirteen CPGs focused on children and adults,^{31,32,36,37,41,42,47,48,51,52,56–58} thirteen towards children alone^{6,33–35,39,40,43,44,46,49,53,54,59} and four towards adults only.^{38,45,48,55} Regarding intended users, fourteen were primarily targeted at dental professionals,^{31,32,34,36–39,42,45,53–56,58} another seven were targeted specifically at paediatric dental professionals,^{35,40,43,44,46,49,59} six were aimed at a broader range of health-care workers,^{6,33,41,48,50,52} one for dentists who practice oral and maxillofacial surgery,⁴⁷ one towards anaesthetists⁵¹ and one where the target population was not reported.⁵⁷

Scope of CPG was mainly refined by age^{6,33,35,39–44,46,49,53,54,59} or procedure, such as the use of sedation/general anaesthesia,^{31,32,36,38,45,47,50–52,56,57} with others restricted to specific conditions. Each CPG had a unique focus, meaning that they tended to emphasize specific techniques rather than try to be comprehensive: 16 were focused mainly on pharmacological supports,^{6,31,32,35,36,38,39,45–47,50–52,55–57} six on non-pharmacological behaviour support^{33,34,37,41,58,59} and three on physical support.^{42,48,49} Another two focused on local anaesthesia^{44,54} and three were focused on specific operative/preventive oral procedures.^{40,43,53}

3.3 | What terms are given to DBS and how are they categorized (Questions 2&3)?

Behaviour management was the most commonly used term to describe DBS ($n=8$), followed by *Behaviour Guidance* ($n=5$), *Patient management* ($n=4$), *Behaviour support* ($n=1$), *Behaviour control* ($n=1$), and *Stress reduction techniques* ($n=1$), as evident in [Supplemental file 1](#). No term was reported in ten CPGs and none championed one term over others. Terms used to categorize DBS techniques were not homogenous and no efforts towards definitive taxonomic development were evident. No categorisation was identified in 17 CPGs. Where categorisations were made, these were often based on variations of the distinction between (behavioural guidance/management/support) versus (sedation/GA) +/- versus (physical) or (environmental).^{34,37,43,48,50,58} Others emphasized pharmacological versus non-pharmacological distinctions.^{39,42,59} Techniques were also categorized as basic or advanced.⁴¹ When the focus was solely on sedative techniques, the categorisation of sedation varied according to route of administration, formulation or depth of anaesthesia, depending on context.^{6,32,46,52,55}

3.4 | What DBS labels and descriptors are recorded in CPGs (Question 1)?

Initially, 212 labels were extracted; 23 were removed because they did not fit the definition of a DBS. Thus 189 DBS labels were included

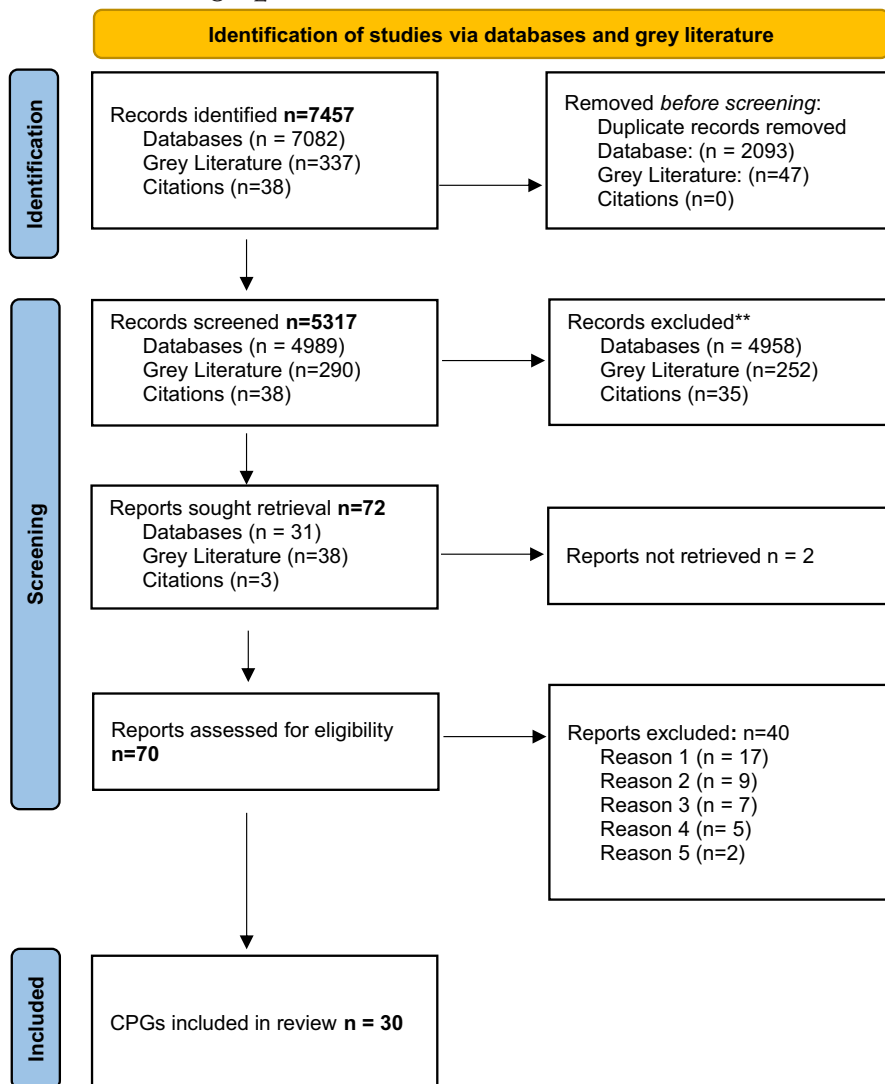


FIGURE 1 Prisma Flow. Reason 1= Not a CPG; Reason 2= Duplicate; Reason 3= CPG does not label and or define DBS techniques; Reason 4: Date of Publication/Superseded; Reason 5: Unable to source; Reason 6= NOT published by guideline developing institutions. From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: [10.1136/bmj.n71](https://doi.org/10.1136/bmj.n71); For more information, visit: <http://www.prisma-statement.org/>

for analysis (ranging from 1 to 31 per CPG). Focusing briefly on reporting trends across labels: 57 (30.2%) labels came from the AAPD, 25 (13.2%) from the British Society of Paediatric Dentistry (BSPD) and 21 from British Society for Disability and Oral Health (BSDH) (11.1%). Sixty-seven labels (35.4%) were targeted towards dental professionals, with a further 27% (n = 51) aimed towards pedodontic professionals, specifically with all others being directed at broader, healthcare professionals or carers including dental professionals or anaesthetists; 21 labels (11.1%) were directed only towards adults, whereas 79 (41.8%) were directed at children only, and 89 (47.1%) were directed at both children and adults; 48.1% (n = 91) of labels were considered pharmacological, whereas 51.9% were non-pharmacological. Seventy-one (37.6%) labels came from North America, 61 (32.3%) from UK and 30.1% (n = 57) from elsewhere. Regarding the discipline of the publishing group: 88 labels (46.6%) came from paediatric groups, 29 (15.3%) from general dentistry, 24 (12.7%) from special care dentistry and 48 (25.4%) from other or mixed disciplines.

Extracted labels from included records were aggregated into 51 distinct labels and descriptors as presented in [Table 1](#), alongside notes and references to modifications or combinations of labels or

descriptions. Two labels related to physical DBS techniques, eight related to pharmacological and forty-two related to others. GA was the most commonly reported DBS.

3.5 | What theoretical basis is given (Question 4)?

Only three formal, underlying theories were identifiable: two adult *learning theories* and the *Transtheoretical model*.⁶⁶ Specific theories as to how individual DBS techniques led to behaviour support, or mechanisms of action for pharmacological techniques, could be inferred for 35 original labels, although they were rarely presented in such terms.

4 | DISCUSSION

4.1 | Major findings

This synthesis, which was limited to CPGs only, illustrates the lack of consensus over what to term this field of clinical dentistry: *Behaviour management* was the most common term applied in CPGs for children,

TABLE 1 List of dental behaviour support techniques identified in clinical practice guidelines.

Label ^a	Description of technique ^b	n	Label derivation or compilation where relevant* Theoretical basis where given
1 Enhancing control ^{41,53,59}	Allows the patient to assume an active role during the dental experience by enhancing their feeling of control ⁴¹	4	
2 Structured time ⁵³	Provides a comprehensible timeframe in the dental experience with timed intervals <i>De novo</i>	1	
3 Magic Trick ⁵⁹	An act of illusion used to distract, engage or relax during the dental experience <i>De novo</i>	1	
4 Distraction ^{34,41,42,44,46,49,53,59}	Diversion of attention during the dental experience from what may be perceived as unpleasant ⁴¹	8	
5 Motivational Interviewing ^{41,59}	Collaborative, person-centred, guidance in the dental experience, to elicit and strengthen motivation for change of dental behaviours ⁶⁰	2	
6 Memory restructuring ^{41,59}	Helping patients develop positive memories of the dental experience ⁵⁹	2	
7 AAC: Augmentative, alternative communication ⁶¹	A system of communication in the dental experience that is not verbal/vocal, which can be aided (e.g. device, communication book) or unaided (e.g. sign language) ⁶¹	3	Compiled from <i>Adjustments or alternative methods of communication</i> ⁵⁰ ; <i>Appropriate communication strategies</i> ⁴⁸ ; <i>Picture exchange communication system (PECS)</i> ⁴¹
8 Visual supports ⁶¹	A visual display that supports the learner engaging in a desired behaviour or skills in the dental setting ⁶¹	3	Compiled from: <i>Patient stories or photographs</i> ⁵⁰ ; <i>Visual pedagogy</i> ³⁷ ; <i>Visual Schedules</i> ³⁴
9 Embedded suggestion ⁶²	Placing a suggestion, expressed in a subtly different tone, within a sentence during the dental experience to support the desired behaviour ⁶²	1	Derived from <i>Embedded commands</i> ⁴⁸
10 Clinical empathy ⁶³	Active assessment of a patient's emotions and responding to patient cues in the dental setting ⁶³	2	Compiled from <i>Empathetic communication style</i> ⁴¹ ; <i>Empathy</i> ⁵⁹
11 Non-verbal prompts ⁶¹	Providing gestural or physical cues to the patient to support them in acquiring or engaging in the dental experience <i>De novo</i> Influenced by <i>Prompting</i> ⁶¹	2	Derived from <i>Nonverbal communication</i> ^{41,59}
12 Voice control ^{34,41,59}	The use of deliberate alteration of voice volume, tone, or pace in the dental experience to direct the patient's behaviour. ⁴¹	3	
13 Person-centred communication <i>De novo</i>	Intentional modification of language to accommodate the patient's development and verbal ability during the dental experience <i>De novo</i>	2	Compiled from <i>Age-appropriate terminology</i> ⁴⁴ ; <i>Child-centred approach</i> ⁵⁹
14 Ask-Tell-Ask ⁴¹	A system of communication where one asks, tells and then asks a patient in a systematic and intentional way to improve the patients' understanding and promote adherence in the dental experience. Modified from ⁴¹	1	Adult learning theory ^{c 41}
15 Verbal prompts: Instruction ⁶¹	Providing clear instructions to guide the patient in acquiring or engaging in a targeted behaviour in the dental experience <i>De novo</i> Influenced by <i>Prompting</i> ⁶¹	1	Derived from <i>giving clear and specific instructions</i> ⁴¹
16 Verbal prompts: reassurance ⁶¹	Providing reassurance as a cue to guide the patient in acquiring or engaging in a targeted behaviour in the dental experience <i>De novo</i> Influenced by <i>Prompting</i> ⁶¹	1	Derived from <i>verbal reassurance</i> ⁴¹
17 Behaviour shaping ^{41,53,59}	Reinforcement of successive approximations to a behaviour in the dental experience to produce new forms of operant behaviour. Also called approximation conditioning; shaping. ⁶⁴	3	
18 Positive reinforcement ^{34,41,42,53,59}	Presenting a positive reinforcer after a response that increases the probability of occurrence of a behaviour in the dental experience. ⁶⁴	5	Including <i>Positive Verbal Reinforcement</i> ³⁴ and <i>Reinforcement</i> ⁴²
19 Negative reinforcement ⁵⁹	Removing, preventing, or postponing an aversive stimulus as a consequence of a behaviour in the dental experience, which, in turn, increases the probability of that behaviour. ⁶⁴	1	

(Continues)

TABLE 1 (Continued)

	Label ^a	Description of technique ^b	n	Label derivation or compilation where relevant* Theoretical basis where given
20	Guided imagery ⁴⁶	Encouraging a person to visualize images as a means of relaxing in the dental experience <i>De novo</i>	1	
21	Clinical Hypnosis ^{46,59}	A therapeutic communication conveyed verbally, that directs the subject's imagination in such a way as to elicit intended alterations in sensations, perceptions, feelings, thoughts and behaviour in the dental experience ⁶²	2	Derived from <i>hypnosis</i> ^{46,59}
22	Music therapy ⁴⁸	Using music as an adjunct to enhance the patient's psychological, physical, cognitive, or social functioning in the dental experience. ⁶⁴	1	
23	Progressive muscle relaxation ⁵⁹	A technique used to train a person to relax the entire body in the dental experience by becoming aware of tensions in various muscle groups and then relaxing one muscle group at a time. ⁶⁴	1	
24	Breathing retraining ⁶⁴	A technique used in behaviour therapy and cognitive behaviour therapy, particularly in the treatment of hyperventilation in panic and other anxiety disorders. The technique teaches clients slow diaphragmatic breathing through various methods, including therapist modelling and corrective feedback. ⁶⁴	1	Derived from <i>relaxation</i> with a description of breathing retraining ⁵³
25	Relaxation techniques ⁴⁸	The use of muscle-relaxation techniques in the dental setting to aid in the treatment of emotional tension. ⁶⁴	1	
26	Social stories ³⁴	Interventions that describe social situations in the dental context in order to highlight relevant features of a target behaviour or skill and offer examples of appropriate responding ⁶¹	1	
27	Pre-visit Preparation <i>De novo</i>	A technique of intentionally preparing the patient or dental team for the dental experience through pre-learning, consultation and sharing information about the dental setting and/or the patient <i>De novo</i>	2	Compiled from <i>home based preparation</i> ³⁴ and <i>preparatory information</i> ³³
28	Patient-centred scheduling <i>De novo</i>	A technique of intentionally structuring the timing of the dental experience to the patients' needs and preferences <i>De novo</i>	3	Compiled from <i>scheduling appointments</i> , ³³ <i>appointment scheduling</i> ⁴¹ ; <i>timing of appointments, medication and other aspects of daily routine</i> ⁴⁸
29	Sensory integration ⁴²	A technique that targets a person's ability to integrate sensory information (visual, auditory, tactile, proprioceptive, and vestibular) from their body and environment in order to respond using organized and adaptive behaviour in the dental experience ⁶¹	4	Compiled from <i>sensory integration</i> ⁴² ; <i>sensory techniques</i> ³⁴ ; <i>sensory-adapted dental environments (SADE)</i> ⁴¹ ; <i>snoezelen environment</i> ⁵⁹
30	Animal Assisted Therapy ⁴¹	A goal-oriented intervention which utilizes a trained animal in a healthcare setting to improve interactions or decrease a patient's anxiety, pain, or distress. ⁴¹	1	
31	Presence/absence of other <i>de novo</i>	A technique of selectively modifying the presence or absence of a parent or other significant other to increase the likelihood of applying or engaging in a behaviour in the dental setting <i>De novo</i>	3	Compiled from <i>parental presence</i> ⁴⁶ ; <i>parental presence/absence</i> ^{34,41}
32	Social environment <i>de novo</i>	A technique of intentionally structuring the physical and social environment in the dental experience to convey a welcoming, positive and non-anxiety evoking experience to the patient and those who support them <i>De novo</i>	1	<i>Supporting the whole family</i> ⁴⁹ <i>child-friendly environment</i> ⁴¹ ; <i>staff approach</i> ⁴¹
33	Consistency ⁴⁸	A technique used to increase the likelihood of applying or engaging in a behaviour in the dental setting in the dental experience by providing a predictable expectation <i>De novo</i>	1	
34	Preparatory visit <i>de novo</i>	A technique of intentionally preparing the patient and dental team for the dental experience through preparatory visit(s) <i>de novo</i>	3	<i>Pre-appointment visit</i> ⁴¹ ; <i>pre-admission visit</i> ⁵⁰ ; <i>acclimatization</i> ⁴⁸
35	Desensitization ^{34,41,42}	A technique used to reduce emotional or physical reactivity to stimuli in the dental experience that is achieved by such means as deconditioning, rehearsal or breathing techniques to control anxiety. ⁶⁴	3	

TABLE 1 (Continued)

Label ^a	Description of technique ^b	n	Label derivation or compilation where relevant* Theoretical basis where given
36 Graded exposure ⁵⁹	A form of therapy, whereby anxiety-provoking stimuli related to the dental experience are listed in order from weakest to strongest; and (c) each of these situations is presented in imagination or in reality, beginning with the weakest <i>De novo e</i>	1	
37 Cognitive Behavioural Therapy ⁵²	A form of psychotherapy that integrates theories of cognition and learning with treatment techniques derived from cognitive therapy and behaviour therapy. CBT assumes that cognitive, emotional, and behavioural variables are functionally interrelated. Treatment is aimed at identifying and modifying the client's maladaptive thought processes and problematic behaviours through cognitive restructuring and behavioural techniques to achieve change. Also called cognitive behaviour modification; cognitive behavioural therapy. ⁶⁴	2	Including <i>cognitive behavioural techniques</i> ⁵⁴
38 Systematic desensitization ^{53,59}	A form of behaviour therapy in which counterconditioning is used to reduce anxiety associated with the dental experience involving three steps: a. patient is trained in deep-muscle relaxation; b. Anxiety-provoking stimuli related to the dental experience are listed in order from weakest to strongest; and (c) each of these situations is presented in imagination or in reality, beginning with the weakest, while the patient practices muscle relaxation [<i>added from</i> ⁵²] or reinforcement ⁶⁴	2	
39 Tell-show-do ^{34,41,53,59}	A technique involving verbal explanations of procedures in phrases appropriate to the developmental level of the patient (tell); demonstrations for the patient of the visual, auditory, olfactory, and tactile aspects of the procedure in a carefully defined, nonthreatening setting (show); and then, without deviating from the explanation and demonstration, completion of the procedure (do). ⁴¹	4	Learning theory ^{c 49}
40 Modelling ^{41,42,59}	A technique used in the dental experience in which learning occurs through observation and imitation	3	Including <i>direct observation</i> ⁴¹
41 Premedication ⁵²	A low dose of benzodiazepine prescribed for anxiolysis to assist with sleep the night before treatment or to aid an anxious patient's journey under close supervision to the treatment facility ⁵²	2	Combining <i>preoperative pharmacological anxiolysis</i> ⁵⁰ ; <i>anxiolytic drug</i> ³⁶
42 Intramuscular sedation <i>de novo</i>	A sedative technique, defined by route of administration, delivered by intramuscular injection <i>De novo</i>	1	Derived from <i>intramuscular ketamine</i> ⁵⁰
43 Inhalation sedation ^{48,52,53,55,56}	A sedative technique, defined by route of administration, where a titrated dose of nitrous oxide with oxygen is titrated through a dedicated delivery machine <i>De novo d</i> . NOTE: Inhalation sedation merged with nitrous oxide related sedation techniques as both infer route of administration as well as formulation; often covered under minimal sedation.	13	Includes <i>nitrous oxide</i> ^{34,39} ; <i>nitrous oxide/oxygen inhalation</i> ^{41,43} ; <i>nitrous oxide and oxygen</i> ³¹ ; <i>nitrous oxide conscious sedation</i> ⁵⁷ ; <i>nitrous oxide/oxygen inhalation sedation</i> ^{6,52,55} ; <i>Inhalational sedation and/or analgesia</i> ⁵⁶
44 Oral/transmucosal sedation ^{50,52,55}	A set of sedative techniques, defined by route of administration, where a sedative drug (usually midazolam) is administered orally, buccally, intranasally or rectally for the purpose of conscious sedation <i>De novo d</i>	4	Includes <i>Intranasal premedication</i> ⁵⁰ ; <i>oral and transmucosal sedation with midazolam</i> ⁵² <i>Oral sedation</i> ⁴⁸ ; <i>orally/transmucosally sedation (intranasal/buccal)</i> ⁵⁵
45 Intravenous sedation ^{48,52,53,59}	A sedative technique, defined by route of administration, where a titrated dose of sedative agent, such as Midazolam, is titrated intravenously for the purpose of conscious sedation <i>De novo d</i>	4	
46 General anaesthesia ^{31,32,34-37,40,41,43-48,50-53,55,56,58}	General anaesthesia is a drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired. ⁶⁵	21	

(Continues)

TABLE 1 (Continued)

Label ^a	Description of technique ^b	n	Label derivation or compilation where relevant* Theoretical basis where given
47 Conscious sedation/moderate sedation/analgesia ⁶⁵	Moderate sedation/analgesia ('Conscious Sedation') is a drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained. ⁶⁵	32	Includes: <i>Conscious sedation</i> ^{34,36,38,49,50,52,54-57} <i>sedation</i> ^{31,40,41,43,44,51,58} <i>moderate sedation</i> ^{31,32,45,47,56} <i>moderate-deep sedation</i> ³⁷ <i>sedation techniques and drugs</i> ⁵⁴ <i>procedural sedation and/or analgesia</i> ³⁶ <i>chloral hydrate conscious sedation</i> ⁵⁷ <i>conscious sedation (midazolam)</i> ^{6,57} <i>sedation using midazolam and nitrous oxide</i> ⁶ <i>conscious sedation (triazolam)</i> ⁵⁷
48 Minimal sedation/anxiolysis ⁶⁵	Minimal Sedation (Anxiolysis) is a drug-induced state during which patients respond normally to verbal commands. Although cognitive function and physical coordination may be impaired, airway reflexes, and ventilatory and cardiovascular functions are unaffected. ⁶⁵	5	Includes <i>minimal sedation</i> ^{31,32,45-47}
49 Deep sedation ^{31,32,35,38,45-47,56}	Deep sedation/analgesia is a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully** following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained. ⁶⁵	8	Includes <i>deep sedation/analgesia</i> ⁴⁶
50 Clinical holding ⁴⁸⁻⁵⁰	The use of physical holds to limit or restrict an individual's ability to move during the provision of 'safe care' in the dental experience ⁴⁸	3	
51 Protective stabilization ^{34,41,42,46,58}	Protective stabilization is utilized in dentistry for the physical limitation of a patient's movement by a person or restrictive equipment, materials or devices for a finite period of time in order to safely provide examination, diagnosis, and/or treatment. ⁴²	5	Immobilization devices (protective stabilization) ⁴⁶

Note: Terms removed from list: Reason = Higher order labels that are used to group multiple techniques or umbrella terms for sets of approaches used in dentistry or: *Positive behaviour support*; *Applied Behaviour Analysis (ABA)*; *Behaviour guidance*; *Behaviour modification*; *Behaviour support*; *Behaviour techniques*; *Communication*; *Communicative guidance*; *Pharmacological behaviour management techniques*; *Physical focus techniques*; Reason = Not DBS techniques: *Coping strategies*; *Careful preparation*; *Hand-over-mouth*; *Medical consultations*; *Overview of goals and progression of treatment*; *Patient assessment*; *Planning dental treatment*; *Pre-operative assessment proforma*; *Teach Back*.

^aLabel as agreed by research team having reviewed emerging labels and literature.

^bDescription as agreed by research team having reviewed emerging labels and literature.

^cGrand theory given in source CPG.

^dInfluenced by Scottish Dental Clinical Effectiveness Programme Guidance.⁵²

^eInfluenced by definition for systematic desensitization.

^{De novo}Novel label or description derived through literature review and discussion.

and *patient management* for adults. In North America, *behaviour guidance* and *patient management* were preferred terms, whereas *behaviour management* was most likely used in UK and Europe. Paediatric dentists used the terms *behaviour guidance* and *behaviour management* predominantly, whereas Special Care Dentistry and Oral/Maxillofacial Surgery were more likely to use *patient management*.

Management, as a term applied to patient care, is incompatible with current concepts of person-centred care and models of health and function.¹⁰ *Behaviour support* was used in one CPG, and yet, DBS is the term suggested by the BeSiDe team as the preferred term for this field. For clarity, dental behaviour support

is practiced with all patients. The use of the contextual term *DENTAL* relates the use of techniques to dental practice and related contexts, such as mobile dental units, domiciliary care settings, hospital theatres, psychotherapeutic dental settings, etc. While the techniques listed here may be used in related contexts (e.g. a parent brushing a child's teeth), the scope of this project lies purposefully within a professional oral healthcare context. The term *BEHAVIOUR* explicitly relates to overt and covert patient behaviours that enable or inhibit professional oral healthcare and excludes oral health behaviours not directly relevant to professional oral healthcare, such as home care, dietary behaviours and

smoking. The term *SUPPORT* conveys a person-centred practice between a professional and patient, where the aim is to promote positive (and inhibit incompatible) behaviours to improve the experience and outcomes of professional oral healthcare. While, the term DBS may evoke the field of *positive behaviour support* (PBS)⁷ and similarities exist (person-centred, flexible, empirically informed), they are distinct. Relative to PBS, which applies across contexts, involving comprehensive lifestyle and systems change, mainly involving people with neurodevelopmental disorders,⁶⁷ DBS is highly context-specific and limited in scope, with a broader range of potential techniques and target population.

From this review, no definitive means of categorizing techniques were found, though one is clearly needed.¹⁴ In fact, single documents often used multiple systems to categorize. This highlights the need to develop an agreed language and structure around how ways to support dental patients are considered. The literature suggests that it may be beneficial to have multiple ways of categorizing DBS, as was the case for pharmacological DBS techniques seen in the CPGs reviewed. In the current review, pharmacological DBS techniques were interchangeably sorted across multiple axes depending on the purpose of the description and intention of the authors. For example, sedation was categorized according to level of sedation, drug formulation or mode/route of delivery.^{6,38} Often these differing approaches were combined in single documents, highlighting the utility of grouping techniques according to different attributes depending on the perspective taken at any time.

There is also no universally accepted aim for dental behaviour support as a whole, although generally, when it was reported, there were at least two, for example, to maintain oral health and, another to enable or encourage engagement with dental services.^{6,53} The sheer diversity in DBS techniques seen here indicated that there must be multiple aims that apply within DBS, depending on the specific technique used. The authors suggest that DBS aims to support patients' behaviours to receive safe, effective and acceptable professional oral healthcare through specific passive or active interactions practiced with the patient that support positive behaviours (and inhibit incompatible behaviours) promoting appropriate professional oral healthcare, a positive short-term and long-term experience of professional oral healthcare, and learning for both the dental team and the patient.

This review listed 51 labels and descriptors given to the myriad of techniques used to support patients to receive dental treatment, from an initial 189 records. This is the first time that such an effort to list the ways in which dental patients are supported has been made across dental specialties. Labels were predominantly from North America and the UK and mainly by and for paediatric dentistry. Identifying underlying theory was impossible. Very rarely an explicit theoretical basis was given, and when given was sometimes incorrect. A lack of reported theory underlying the techniques limits understanding of why they may work. The findings suggest a need to clarify the theoretical basis of these techniques and this may further aid with delineating mechanism (e.g. stimulus control) from technique (e.g. prompts). Those who report DBS interventions should define their interventions based on component techniques,

procedure and the mechanism of action/underlying theory to improve future reporting and consistency in terminology. This is fundamental to achieving a game change in this field.

4.2 | Comparison to other studies

While this review was designed to ensure that the language of practice was captured, ultimately, the usefulness of this list will depend on its ability to align practice and research. Compared to reviews of primary research in this field, it is clear that most, but not all, evaluated techniques are captured in the prototype list.^{15-17,68} One review of 29 trials included hypnosis, modelling, guided visualization, enhanced information, relaxation, music, or cognitive-behavioural approaches including distraction, all of which were covered in this list presented here.⁶⁸ Considerable overlap was also seen with another 21 studies involving children, which listed distraction with virtual reality, music, magic tricks and 'counter-stimulation', modelling, preparation and information giving, and, exposure to positive images of dentistry.¹⁶ Significant crossover was again seen in the extensive list of techniques reviewed in an umbrella review focused on children, where interventions were divided as either *AV distraction*, *traditional* and *other*. These techniques were further described as Tell-Show-Do; reward; distraction; modelling; hypnosis; computerized anaesthesia; pharmacological management; virtual reality; music; magic tricks; modelling; exposure to dentally positive images; providing information or preparation; distraction with counter stimulation; distraction with movements; noncontingent stops; camouflage of syringe; non-procedural touch, voice control, positive; and negative reinforcement. The *other* group included aromatherapy, and CBT.¹⁷ Another review of techniques applied with children with autism showed cross-over, listing audiovisual devices containing visual/audiovisual schedules, ABA with visual support cards, visual paedagogy, dental desensitization, preparatory information and modelling with a children's books, graded exposure with reinforcement, a multimodal programme called D-TERMINED, tell-show-do, voice control, nitrous oxide, passive restraint, and active restraint.¹⁵ In a review of interventions for adults with developmental disabilities, Mac Giolla Phadraig et al. reported intervention studies evaluating sensory adapted dental environment, dentist information about the patient, music, video modelling, behaviour modification, animal assisted therapy, systematic desensitization, Tell-Show-Do, familiarization, manageable discomfort, sense of control, positive reinforcement, fidgets and comforters.¹⁴

The above demonstrates that the list of techniques arising from CPGs offers good but not perfect coverage of the techniques that are evidenced in dental research. Extant reviews within the behavioural literature on strategies to treat fears or phobias are available and one specific review examines such strategies within medical/dental routines.²⁰ The findings of the current review were consistent with these previous reviews identifying reinforcement, graduated exposure, modelling,^{69,70} prompting, escape extinction, distraction⁷¹ as effective behavioural strategies in dental procedures.

4.3 | Limitations of literature

Extracting data was often difficult, given their qualitative nature. It was interesting to the reviewers to note that descriptions of behavioural techniques, when compared to their use in other fields of behavioural science such as ABA, were often inaccurate or incorrect. Some extracted labels were clearly not intended as labels and rather as descriptors. These points emphasize the need for this study in the first place. Often it was very difficult to identify what constituted a description, instruction, aim or theory associated with a specific technique and often these were brought together from sections across CPGs. Furthermore, some terms were removed from the list because they were considered to be higher order labels rather than individual supports. These included, for example, Positive Behaviour Support (PBS), ABA, Behaviour modification among others (Table 1). ABA, for example, is a scientific discipline that provides a comprehensive framework and dimensions for practice. It constitutes a myriad of interventions that are underpinned by principles of learning paradigms. Therefore, researchers and practitioners in the field refer to individual behavioural supports by label and refer to the field of practice as ABA.

Regarding time restrictions for selection criteria, a number of CPGs had multiple publication dates or had none at all, meaning that judgements had to be made on inclusion of a number of CPGs with multiple publication dates inside and outside of the specific date range.^{34,59}

4.4 | Limitations of the review

This review had a number of limitations. Firstly, the review was limited to CPGs only. While a broad definition of CPG was adopted to enhance inclusion, by design this excluded primary research. This means that there are likely to be many omissions, although what was found was likely to have some degree of inherent agreement therein. Reviews of the literature relating to behavioural strategies drawn from dentistry and the field of ABA exist. However, these are limited to developmental disability populations and focus on treatment of fears, phobias and medical noncompliance.^{15,20} Readers are therefore cautioned that the current review did not include a comprehensive search strategy of databases within the fields of behaviour science (e.g. ABA) and recommend updated examinations of such research studies beyond developmental disability populations.

Furthermore, it should be noted that this current list of 51 labels is not complete and should not be considered the definitive list of supports available to dental professionals. Researchers within the field of ABA, for instance, are continually developing and testing novel strategies to improve individual life outcomes that may also be utilized to support dental treatment. Therefore, the deficiencies evident in reviewing CPGs may result in the omission of some evidence-based practices that could be effectively applied in dental settings. Notably, there was a lack of CPGs from the field of dental

anxiety management, which is obviously an area that needs to be addressed further. Future research undertaken by the BeSiDe team will address this by including perspectives of experts across professions, to ensure a broad range of approaches are incorporated into taxonomical development.

Secondly, it was difficult to extract techniques as defined to be the smallest potentially active component of interventions to support patients, because source labels were not presented with this level of specification. CPGs seldom distinguished between interventions, that is, combinations of techniques, techniques and even mechanisms of action. While the intention was to extract techniques only, the CPGs simply did not present according to this level of specification. Additionally, at times, specific combinations of techniques were more clinically meaningful to list than their component parts (e.g. Tell-Show-Do). Therefore, the resulting list of labels, clearly, refers to techniques, as well as interventions, (e.g. systematic desensitization) and even groups of interventions (e.g. social environment, patient scheduling, pre-visit preparation) in an effort to balance granularity and utility. Further research is needed to disentangle these components of the non-pharmacological interventions in particular.

Thirdly, it was difficult to establish limits as to what constitutes a behaviour support technique. It was decided not to cover local anaesthesia and analgesics, despite their obvious impact on behaviour and anxiety,⁵⁴ to maintain a focused scope. Additionally, it is hard to define where an element of care transitions from behaviour support to a formal operative technique. For example, it could easily be argued that the philosophy of disease management (e.g. traditional versus minimal intervention), choice of instrument (electric vs. hand) or caries removal approach (selective vs. complete) can support patients to receive care acceptably.

4.5 | Implications

This review has generated a list of DBS terms and descriptors from across dentistry. This is the first time a systematically generated list of techniques in DBS has been created and therefore the first time the ways in which dental teams support patients have been systematically presented. The authors do not suggest that this list is comprehensive, nor is it definitive. Rather, it represents a broad sample of the terms used to describe how dental professionals help patients to accept care. Indeed, a further aim of this study was to compile this list as a prototype requiring validation through expert consensus. Therefore, this list will now be used to generate consensus agreement and hierarchical sorting. In addition, the development of a framework for decision making will be required similar to that available in ABA⁷² to assist dental teams identify a function-based model of support. In this way, functional behavioural assessment of each patient's needs would be included alongside other service, patient and dental factors to determine individualized care.

It is important to note that the term *technique* does not suggest that DBS is a simple, intuitive set of procedures that can be simply

chosen and triggered. Rather, the use of such techniques necessitates an appreciation of their mechanisms and procedures, with a need for additional training, qualification, team, equipment as indicated and must only be practiced within one's scope of practice. Although the term *behaviour support* is well aligned with the fields of ABA and PBS, in practice it encompasses teaching, accelerating, altering or maintaining a person's response or response classes to improve a range of life outcomes. In the context of dentistry, the goal for the dental team is to provide successful treatment by assessing individual circumstances and tailoring supports, if necessary, to meet those needs. In some instances, this support arises from numerous types of in situ environmental alterations, preparation and active patient involvement. In other cases, support may involve sedation or anaesthesia to achieve treatment success. Often a combination is applied. The current review therefore includes these practices as supports because in practice they may result in a person achieving dental treatment.

5 | CONCLUSIONS

There is a lack of agreed terminology for the clinical techniques of behaviour support in dentistry across CPGs. There is also a lack of theoretical explanation as to why they work or not. There is a need to agree an appropriate term for behaviour management that reflects the ethos of modern dentistry that works across professional silos, geographic regions and age ranges. Agreement must also be achieved in how to categorize techniques positively. In no other field of clinical dentistry would it be acceptable to practice clinical techniques that are so ill-defined or selected without a clear evidence base. This is the first step in generating agreement around concepts, theory and terminology to enable research, education and improvements in dental behaviour support.

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The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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