NEBDN Special Care Dentistry

Part 4

SATURDAY 4TH OCTOBER

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CONSULTANT IN SPECIAL CARE DENTISTRY (BHSCT)

Saturday 4th October	Subject
9.30am – 11am	Definitions, models and philosophies & Development of Disability Awareness
11.15am – 1pm	Barriers to Provision of Oral Care & Legislation, guidelines and Policies
1.45pm – 3pm	Communication, Organising Care and Supporting the Patient
3.15pm – 4.30pm	Pain and Anxiety Control & Conscious Sedation & General Anaesthetic

Pain and Anxiety Control & Conscious Sedation & General Anaesthetic

Subject	Knowledge *.....should be able to describe:*	Skills *.....should be able to:*	Attitudes and Behaviours *.....should:*	Teaching and Learning method(s)	Assessment method(s)
10.1 Pain and anxiety control	10.1.1 the causes, signs and symptoms of dental anxiety and phobia 10.1.2 the spectrum of anxiety management techniques including behavioural/non-pharmacological methods, conscious sedation and general anaesthesia	10.1.3 communicate effectively with the individual throughout the treatment in the most appropriate manner for that person 10.1.4 recognise that pain and anxiety may be expressed in different ways where people communicate in different ways	10.1.5 recognise the value of effective pain and anxiety control in special care dentistry 10.1.6 demonstrate a caring attitude to people who are anxious	CE SDL ST	FA RoC
10.2 Conscious sedation	10.2.1 the distinction between conscious sedation and general anaesthetic 10.2.2 the distinction between oral sedation and pre-medication 10.2.3 the distinction between inhalation sedation, intravenous sedation, oral and transmucosal sedation, indications for use and advantages/disadvantages of each 10.2.4 the basic properties and sedative/anaesthetic actions of nitrous oxide, midazolam, diazepam, temazepam, flumazenil, propofol and sevofluorane	10.2.5 deliver pre- and post-operative instructions and after care of the sedation patient	10.2.6 recognise the role of all members of the dental team in the management of people who are anxious 10.2.7 recognise the value of effective conscious sedation in special care dentistry	CE SDL ST	FA RoC
10.3 General anaesthesia	10.3.1 the indications for and the advantages and disadvantages of providing care under general anaesthetic	10.3.2 deliver pre- and post-operative instructions and after care of the patient	10.3.3 recognise the value and limitations of general anaesthesia in special care dentistry	CE SDL ST	FA RoC

Anxiety and phobia

Anxiety
A feeling of worry or unease
Exaggerated response to a stressful situation

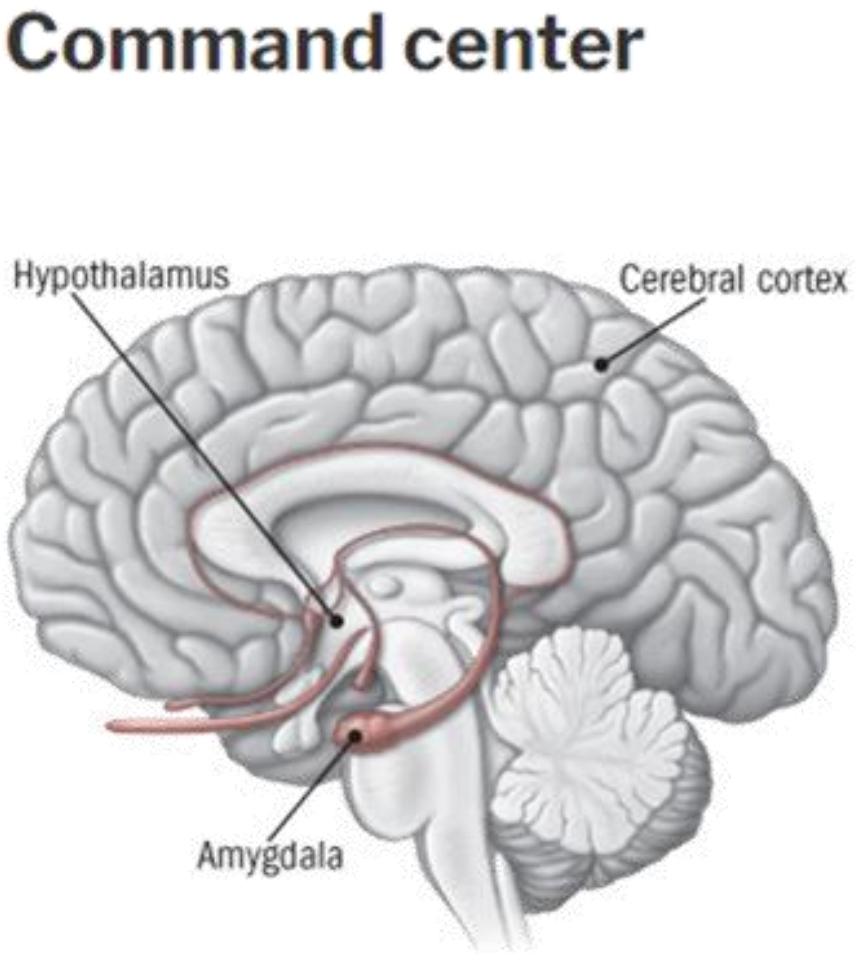
Avoidance, DNAs, talking increased, tense and agitated

Early morning appointments
Oral anxiolytics

Phobia
Type of anxiety disorder
Persistent and excessive fear
Out of proportion to the threat

10% population dental phobia
More likely to use mouthwash than brush teeth (ADHS 2009)

Stress response



Amygdala – emotional processing. Perceives dangers sends distress signal to hypothalamus

Hypothalmus – communicates with the rest of the body and initiates 'fight or flight' mode. Sends signal to adrenal glands to release adrenaline epinephrine

Increase heart rate, increase blood pressure, quicker breathing, pupil dilation, sweating, shaking, gastrointestinal effects (gastric reflux)

May hyperventilate could lead to collapse

Also get release of glucose and cortisol (glucocorticoid) – chronic stress over time increase risk of stroke, cardiovascular events

Signs and Symptoms of Anxiety

- Quiet or talkative
- Tachycardia
- Palpitations
- Hypertension
- Dry Mouth
- Nausea
- Tremor
- Hyperventilation
- Pallor, sweating
- Clenched fists
- Tense posture
- Fidgeting
- Hyper-vigilance
- Multiple causes
- Distracted and unable to concentrate

Causes of anxiety

Multiple causes

- Acquired (ingrained i.e. snakes, spiders or heights)

Endogenous / Exogenous:

- Constitutional predisposition
- Past experience
- Modelling
- Psychodynamically transferred – transfer feelings from the past
- Mis-diagnosed social phobia or other phobia
- PTSD-like

Perception MORE important than Experience

(Armfield, 2008)

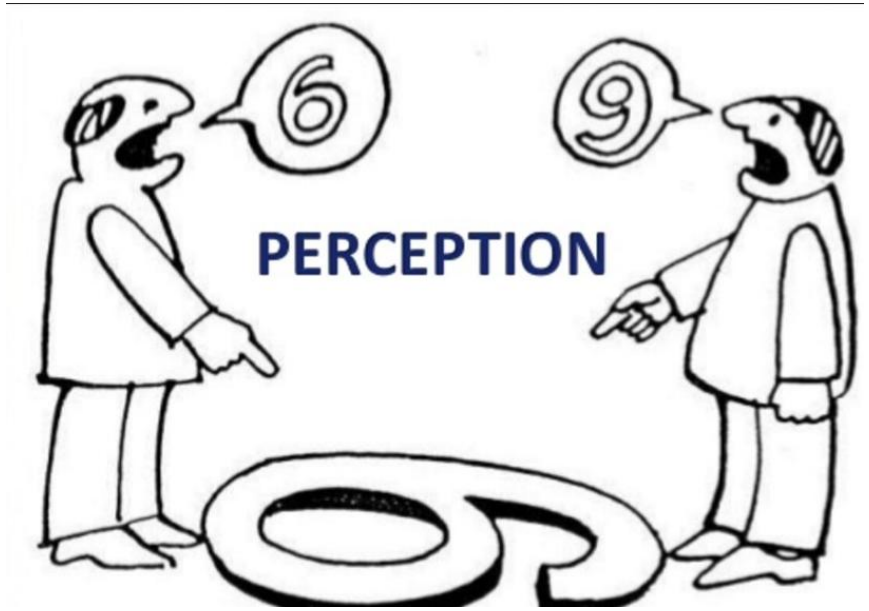
Uncontrollable

Unpredictable

Dangerous

Disgusting

Uncertainty



Epstein et al (1970) two groups of patients.

- First group told 1 in 20 chance of a shock
- Second group 19 in 20 chance.
- Group 1 more anxious. High probability group resigned themselves to the fact pain would happen.

Prevalence Dental Anxiety – ADHS 2021

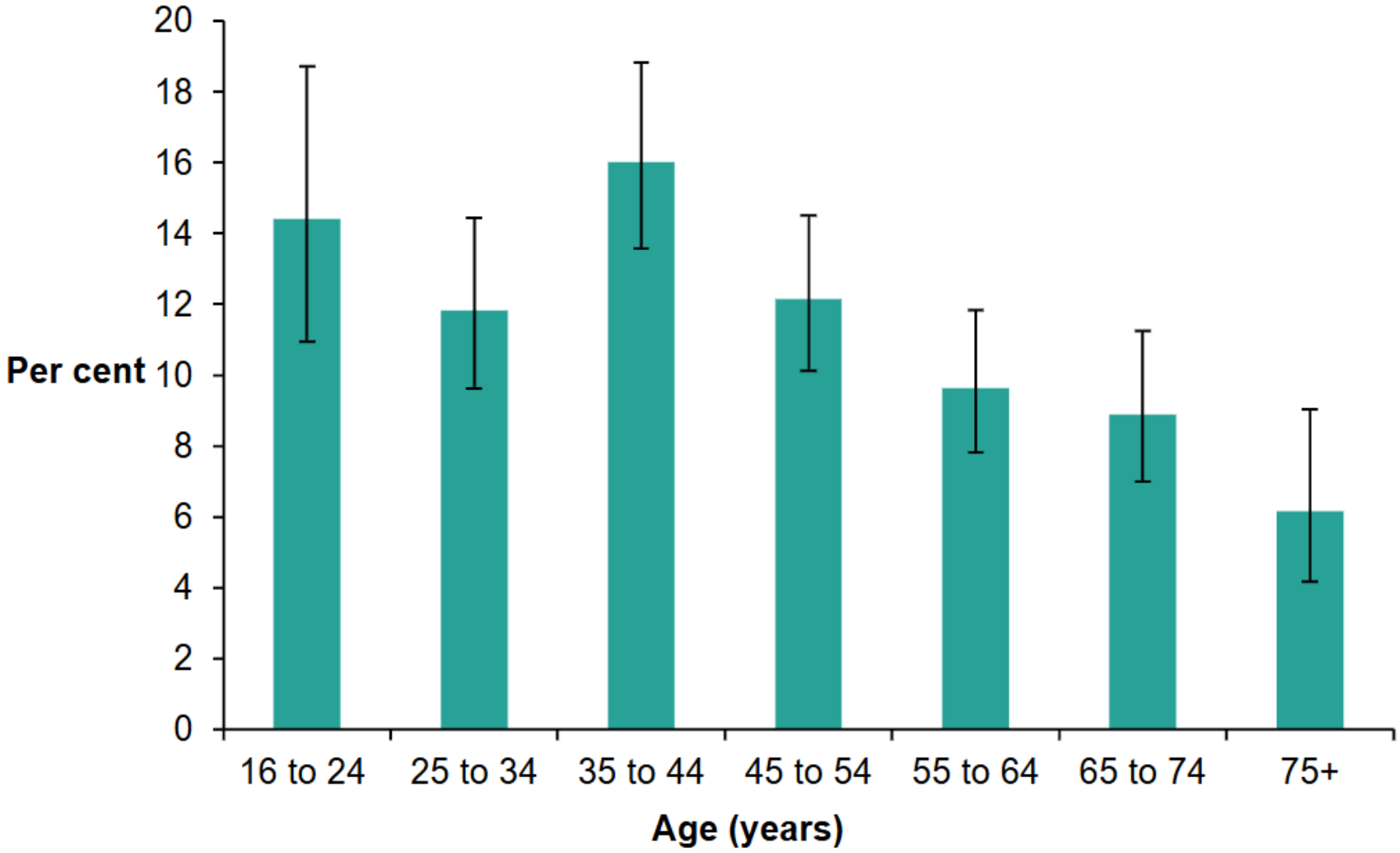
Females ~2x Males

- Regardless of sample chosen
- 1) F> anxious
- 2) F> honest
- 3) F> able to recognise / verbalise emotion

42% Adults natural teeth had moderate dental anxiety
12% Adults natural teeth had extreme dental anxiety

Figure 12: proportion of adults with extreme dental anxiety by age

Base: all adults with natural teeth.



ADHS 2021

Modified Dental Anxiety Scale

CAN YOU TELL US HOW ANXIOUS YOU GET, IF AT ALL, WITH YOUR DENTAL VISIT?

PLEASE INDICATE BY INSERTING 'X' IN THE APPROPRIATE BOX

1. **If you went to your Dentist for TREATMENT TOMORROW, how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

2. **If you were sitting in the WAITING ROOM (waiting for treatment), how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

3. **If you were about to have a TOOTH DRILLED, how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

4. **If you were about to have your TEETH SCALED AND POLISHED, how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

5. **If you were about to have a LOCAL ANAESTHETIC INJECTION in your gum, above an upper back tooth, how would you feel?**

Not Anxious ☐	*Slightly Anxious* ☐	*Fairly Anxious* ☐	*Very Anxious* ☐	*Extremely Anxious* ☐

- 19+ correlates with phobia
- Part of Indicator Of Sedation Need (IOSN)

Modified Dental Anxiety Scale

The Modified Dental Anxiety Scale. Each item scored as follows:

Not anxious	=	1
Slightly anxious	=	2
Fairly anxious	=	3
Very anxious	=	4
Extremely anxious	=	5

Total score is a sum of all five items, range 5 to 25: Cut off is 19 or above which indicates a highly dentally anxious patient, possibly dentally phobic

- 19+ correlates with phobia
- Part of Indicator Of Sedation Need (IOSN)

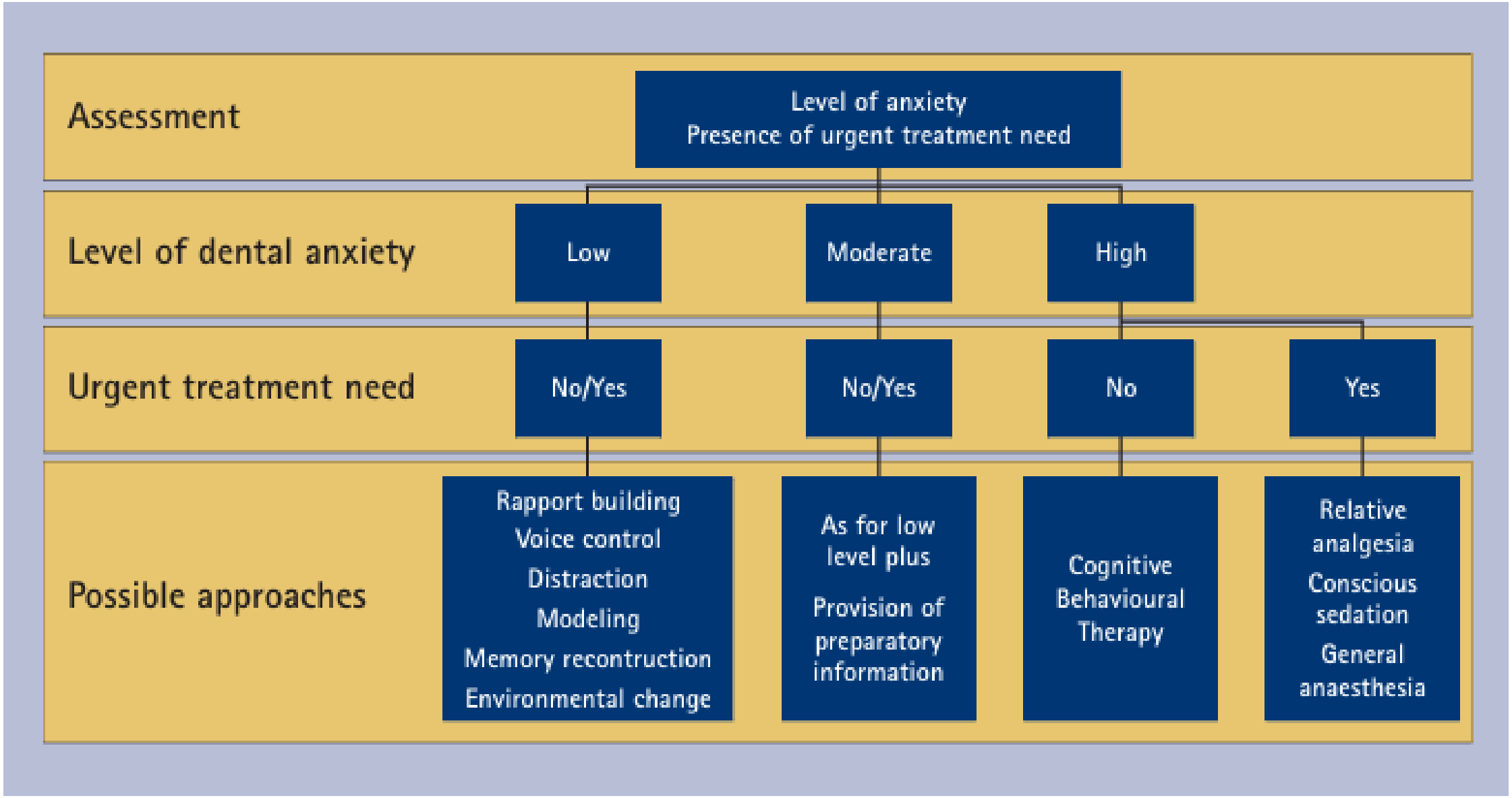
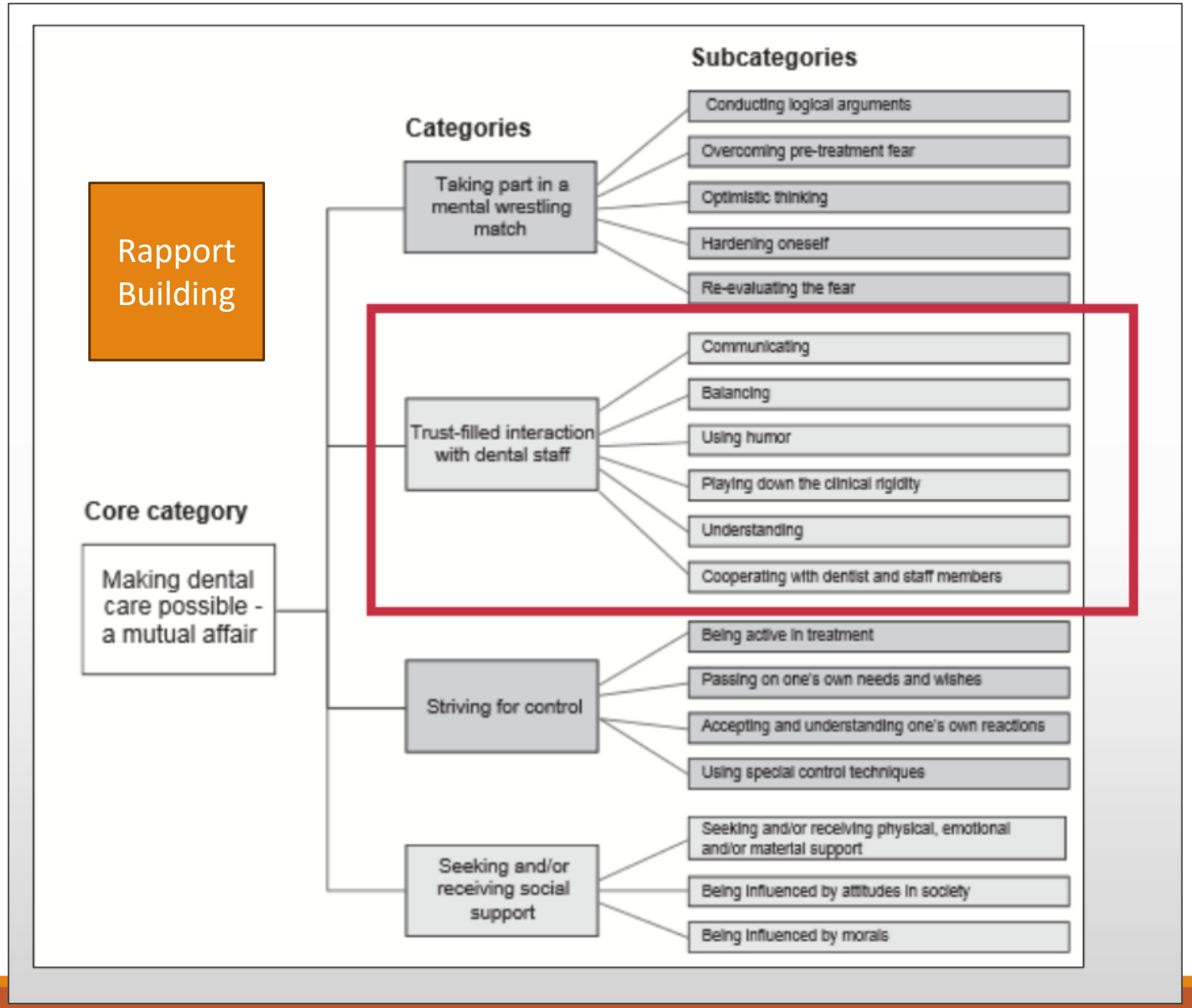


Fig. 1 An outline of approaches to the management of dental anxiety, based on the initial assessment of the level of dental anxiety, followed by proportionate intervention

Rapport Building



Bernson JM, Hallberg LR-M, Elfström ML, Hakeberg M.
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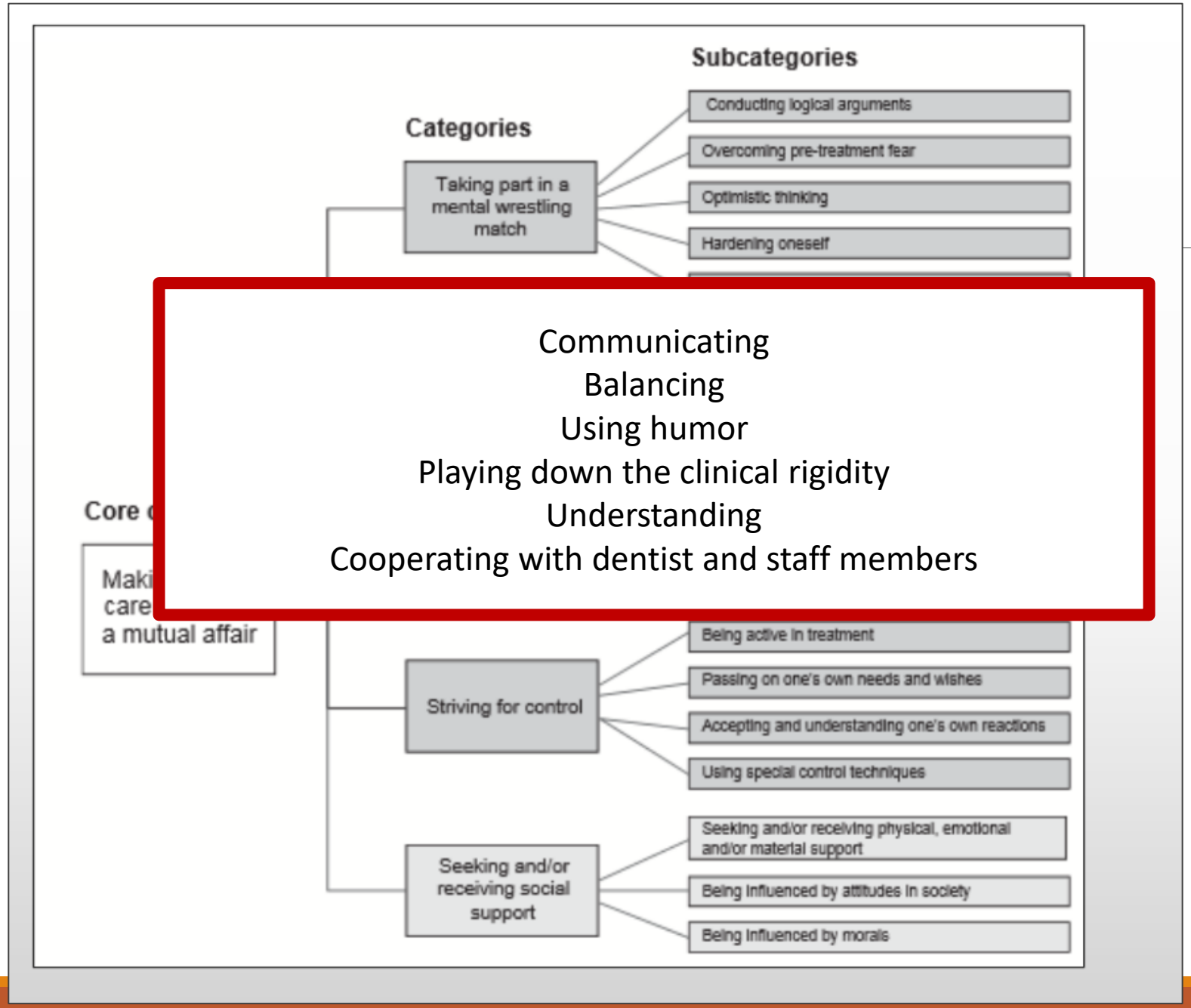
Eur J Oral Sci 2011; 119: 373–380.



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'Making dental care possible – a mutual affair'. A grounded theory relating to adult patients with dental fear and regular dental treatment.
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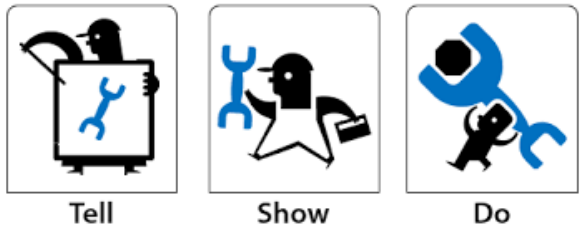
Behaviour management

BUILDING A RAPPORT WITH THE PATIENT IS KEY

Acclimatisation



Modelling

Keep instruments hidden until needed

For sensory overload - sunglasses, ear defenders, music

Positive reinforcement

Use of the WAND
Link : https://www.dentalsky.com/wand_dental

What if behaviour management is not successful?

General Anaesthetic vs Conscious Sedation

General Anaesthetic

‘Any technique using equipment or drugs which produces a loss of consciousness in specific situations associated with medical or surgical interventions’. (ACD, 2000)

Conscious sedation

‘A technique in which the use of a drug or drugs produces a state of depression of the central nervous system enabling treatment to be carried out, but during which verbal contact with the patient is maintained throughout the period of sedation.

The drugs and techniques used should carry a margin of safety wide enough to render loss of consciousness unlikely’. (AoMRC, 2013)

	Minimal Sedation/ Anxiolysis	Moderate Sedation/ Analgesia ('Conscious Sedation')	Deep Sedation/ Analgesia
Responsiveness	Normal response to verbal stimulation	Purposeful* response to verbal or tactile stimulation	Purposeful* response following repeated or painful stimulation
Airway	Unaffected	No intervention required	Intervention may be required
Spontaneous Ventilation	Unaffected	Adequate	May be inadequate
Cardiovascular function	Unaffected	Usually maintained	Usually maintained
Escalation of required competencies			

* Reflex withdrawal from a painful stimulus is NOT considered a purposeful response. Excerpted from Continuum of Depth of Sedation. Definition of General Anesthesia and Levels of Sedation/ Analgesia of the American Society of Anesthesiology. From the ASA, 520N, Northwest Highway, Park Ridge, Illinois, 60068-2573, USA.

General Anaeshthetic

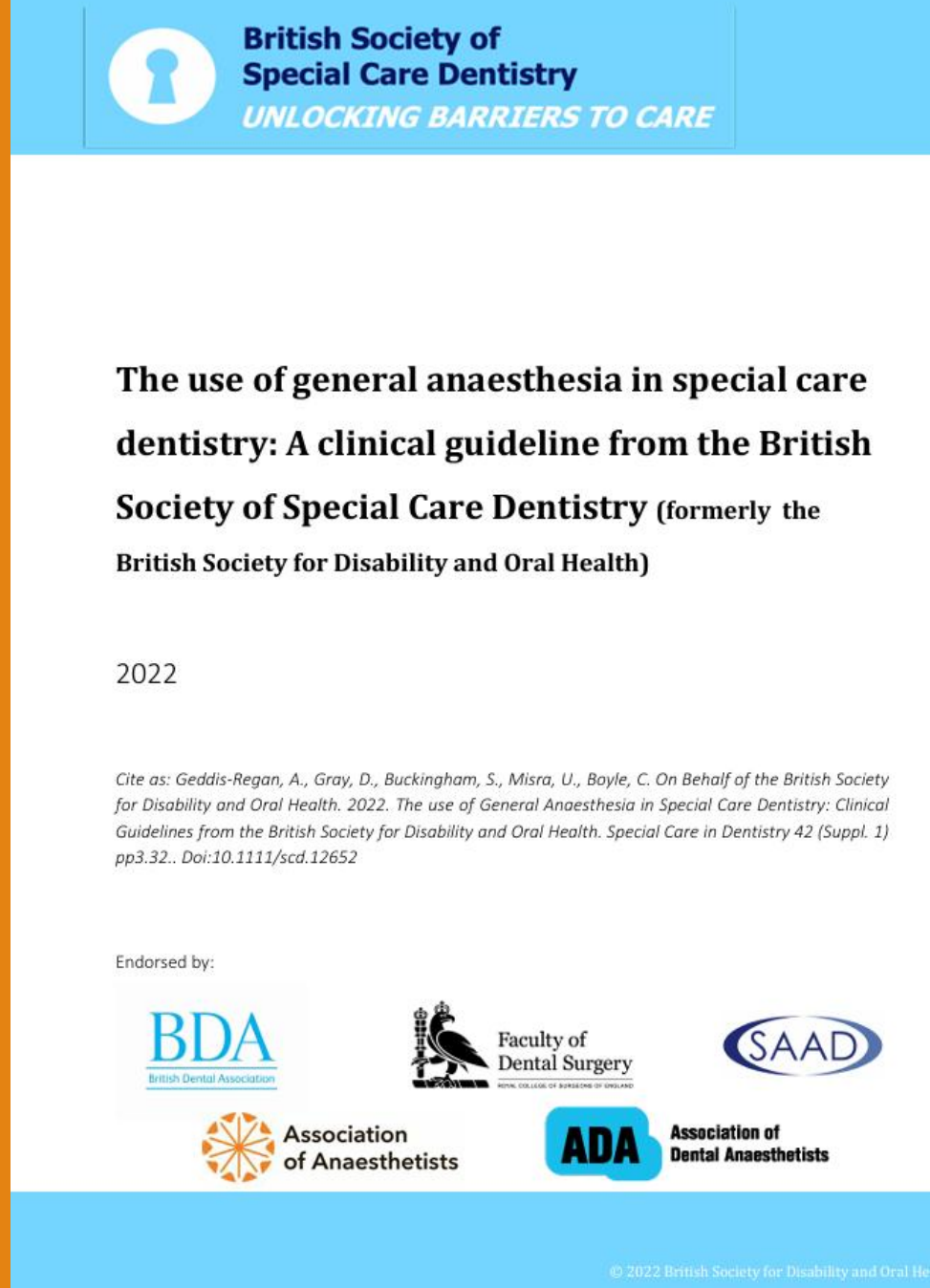
Primary indication lack of co-operation ….systematic assessment reduces the indiscriminate use of general anaesthesia and minimizes complications as well as the need for future interventions

Outlines process of GA for patients from pre-op assessment to recovery

Discusses standards and requirements for GA treatment

Specialist / Consultant led SCD where possible

bsscd.org/index.php/component/edocman/?task=document.viewdoc&id=551&Itemid=



GA - Advantages

- Co- operation
- Treatment carried out in one visit
- Protected airway
- Comprehensive dental treatment

- Optimise treatment opportunities
- Annual Health Checks
- Blood tests to check underlying disease
- Hearing tests
- Joint medical or surgical procedures

Disadvantages

- Risk: death in 1: 100-200,000
- Risk benefit justification (S&P?)
- (In 35yr period before A Conscious Decision (2000), only 7 years were death-free in primary care DGA)
- Unnecessary GA for EUA if no treatment required
- Limited treatment options- space, time, materials, complexity
- Time limitations
- Theatre availability
- Compromise
- Extreme prevention / radical caries management
- No context for patient to evaluate treatment
- May creates dental phobics (Berg et al 1999)

Cost
Environmental concerns
anaesthetic gases

Common events and risks in anaesthesia

This summary card shows the common events and risks that healthy adult patients of normal weight face when having a general anaesthetic for routine surgery (specialist surgeries may carry different risks).

Modern anaesthetics are very safe. There are some common side effects from the anaesthetic drugs or equipment used which are usually not serious or long lasting. Risk will vary between individuals and will depend on the procedure and anaesthetic technique used. Your anaesthetist will discuss with you the risks that they believe to be more significant for you. You should also discuss with them anything you feel is important to you.

There are other less common risks that your anaesthetist will not normally discuss routinely unless they believe you are at higher risk. These have not been shown on this card.

VERY COMMON – MORE THAN 1 IN 10
Equivalent to one person in your family

- Sickness
- Shivering
- Thirst*
- Sore throat
- Bruising
- Temporary memory loss (mainly in over 60s)

COMMON – BETWEEN 1 IN 10 AND 1 IN 100
Equivalent to one person in a street

- Pain at the injection site*
- Minor lip or tongue injury

UNCOMMON – BETWEEN 1 IN 100 AND 1 IN 1,000
Equivalent to one person in a village

- Minor nerve injury

RARE – BETWEEN 1 IN 1,000 AND 1 IN 10,000
Equivalent to one person in a small town

- **1 in 1,000** Peripheral nerve damage that is permanent
- **1 in 2,800** Corneal abrasion (scratch on eye)
- **1 in 4,500** Damage to teeth requiring treatment
- **1 in 10,000** Anaphylaxis (severe allergic reaction to a drug)

VERY RARE – 1 IN 10,000 TO 1 IN 100,000 OR MORE
Equivalent to one person in a large town

The risks we all take in normal life, **such as road travel**, are actually far higher than the risks below.

- **1 in 20,000** Awareness during an anaesthetic
- **1 in 100,000** Loss of vision
- **1 in 100,000** Death as a direct result of anaesthesia

RCoA
Royal College of Anaesthetists

Common events and risks for children and young people having a general anaesthetic

Royal College of Anaesthetists

Association of Paediatric Anaesthetists of Great Britain and Ireland

Trusted Information Creator – Patient Information Forum

This summary card shows some of the common events and risks that healthy children and young people of normal weight face when having a general anaesthetic (GA) for routine surgery (specialist operations may carry different risks).

Modern anaesthetics are very safe. There are some common side effects which are usually not serious or long lasting. Risk will vary between individuals, and will depend on the procedure and the anaesthetic technique used. Your anaesthetist will discuss with you the risks they believe to be most significant. You should also discuss with them anything you feel is important to you.

Very common
More than 1 in **10**
Equivalent to one person in your family

- **Sore throat**
- **Agitation on waking from GA** – Mainly ages 1–6 years
- **Sickness**
- **Temporary changes in behaviour** – eg, anxiety, sleep problems, bedwetting

Common
Between 1 in **10** and 1 in **100**
Equivalent to one person in a street

- **Minor lip or tongue injury**
- **Discomfort at injection site**

Uncommon
Between 1 in **100** and 1 in **1,000**
Equivalent to one person in a village

- **Breathing problems** – Needing treatment
- **Skin damage** – Mainly longer procedures

Rare
Between 1 in **1,000** and 1 in **10,000**
Equivalent to one person in a small town

- **Need for Intensive Care (unplanned)** – 1 in **2,400**. Risk is higher for children under 1 year
- **Injury to eye** – eg, scratch on eye
- **Damage to teeth**

Very Rare
1 in **10,000** to 1 in **100,000** or more
Equivalent to one person in a large town

- **Anaphylaxis** – 1 in **40,000**. Severe allergic reaction to a drug
- **Awareness during an anaesthetic** – 1 in **60,000**
- **Death as a direct result of anaesthesia** – 1 in **100,000** to 1 in a **million**
- **Long-term disability** – Less than 1 in **100,000**

More information

Our website has more on these risks as well as short videos to help children prepare for surgery.

Scan to find out more:

rcoa.ac.uk/childrensinfo

Royal College of Anaesthetists

8.2 | Dental nurses

17) Wherever possible, a lead dental nurse supporting SCD patients receiving GA should have an additional qualification in SCD or additional and appropriate experience and training in the GA and theatre environment.
18) Any dental nurse involved with delivering dental care under GA should seek to achieve the competencies detailed in Table 4.
19) Dental nurses attending GA sessions require a formal period of supervision before being the lead dental nurse.
20) Dental nurses should maintain a logbook during their training period to demonstrate their experience and competencies against the criteria in Table 4.
21) Dental nurses should demonstrate an understanding and have practical experience in managing the many challenges that are involved in planning a theatre session for SCD patients (Table 4)
22) Dental nurses should demonstrate a broad experience of roles within theatre, including working jointly with other theatre team members.

British Society of Special Care Dentistry
UNLOCKING BARRIERS TO CARE

The use of general anaesthesia in special care dentistry: A clinical guideline from the British Society of Special Care Dentistry (formerly the British Society for Disability and Oral Health)

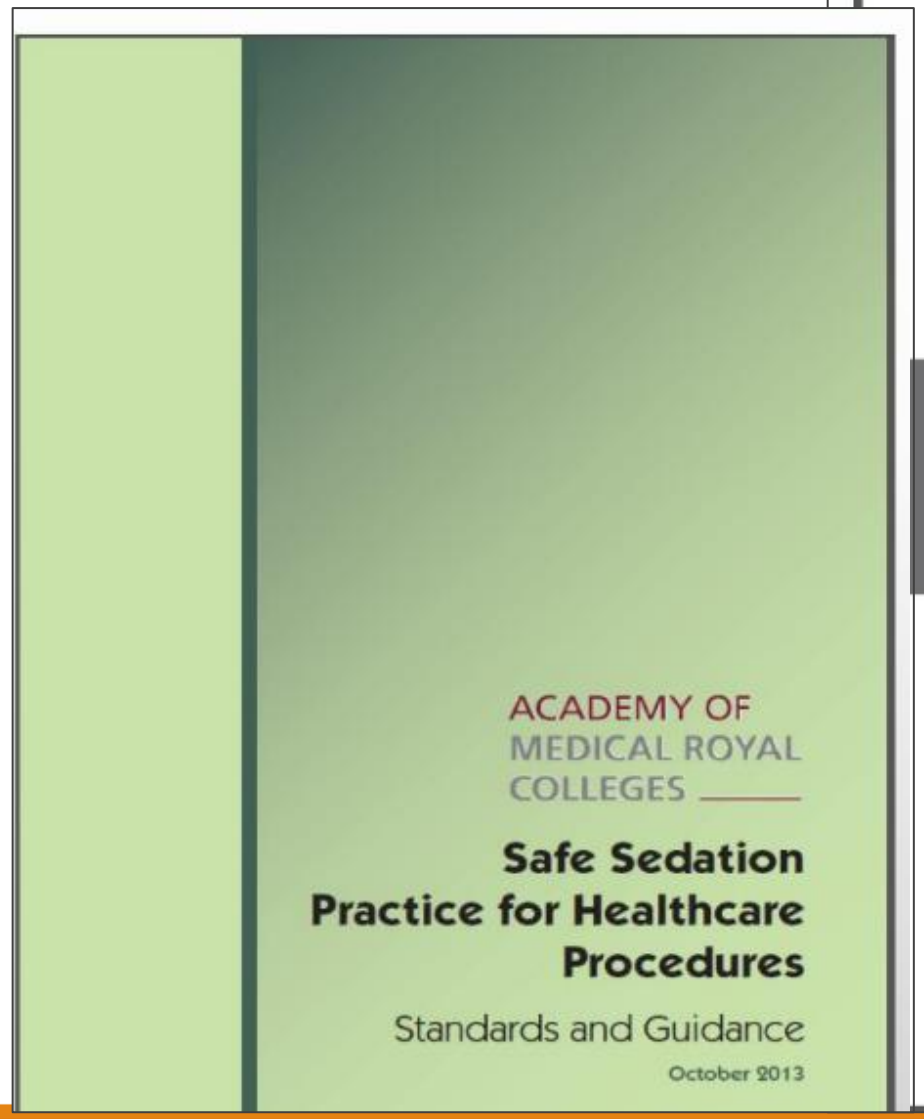
2022

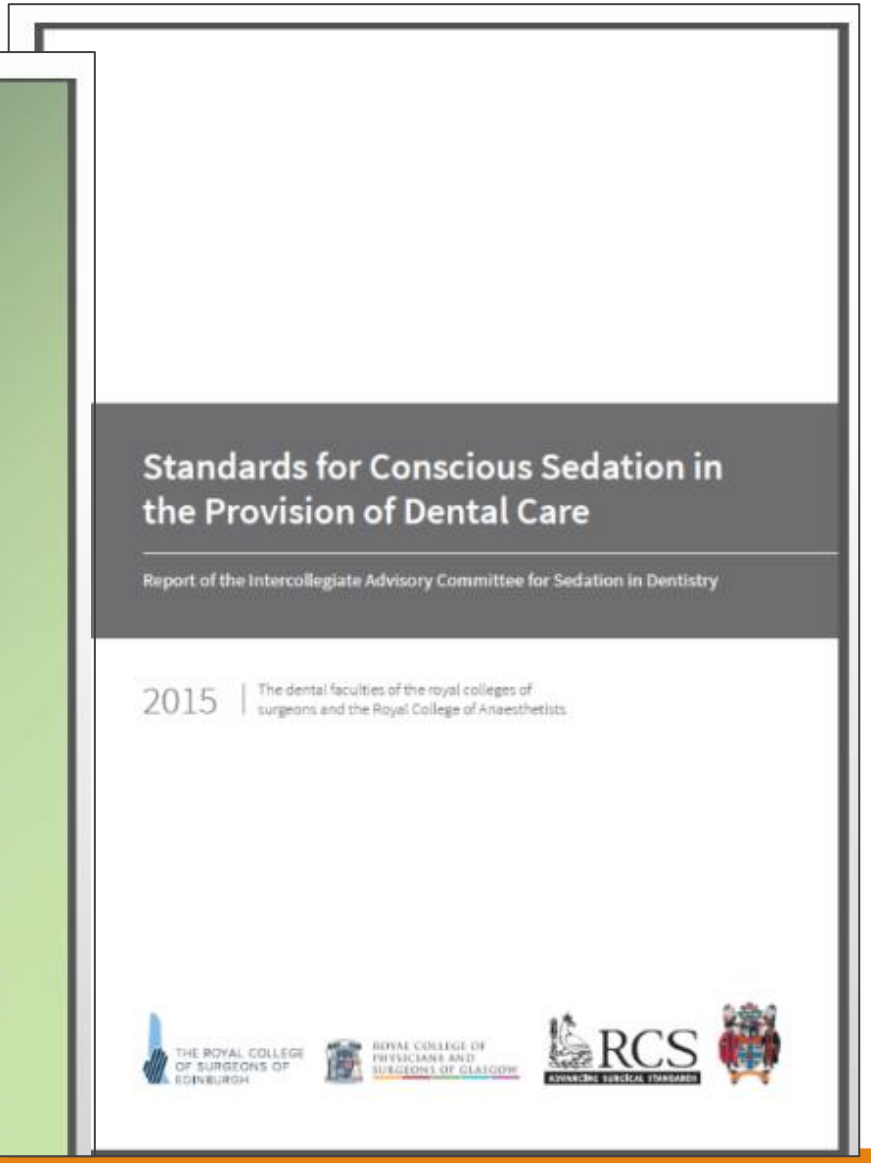
Cite as: Geddis-Regan, A., Gray, D., Buckingham, S., Misra, U., Boyle, C. On Behalf of the British Society for Disability and Oral Health. 2022. The use of General Anaesthesia in Special Care Dentistry: Clinical Guidelines from the British Society for Disability and Oral Health. Special Care in Dentistry 42 (Suppl. 1) pp3.32.. Doi:10.1111/scd.12652

Endorsed by:

BDA British Dental Association
Faculty of Dental Surgery
SAAD
Association of Anaesthetists
ADA Association of Dental Anaesthetists

Sedation guidance





Indications

Medical conditions affecting co-operation

- Parkinson's disease, Huntingdon's disease
- Cerebral Palsy

Medical conditions aggravated by stress

- Ischaemic heart disease, hypertension
- Epilepsy
- Asthma
- Parkinsons disease
- Psychosomatic problems (failed LA?)

Unpleasant procedures

- Surgical procedures
- Gag triggers

Psycho social

- History of gagging
- History of fainting with LA
- LA failure e.g. Ehlers's Danlos
- Sensory processing disorder

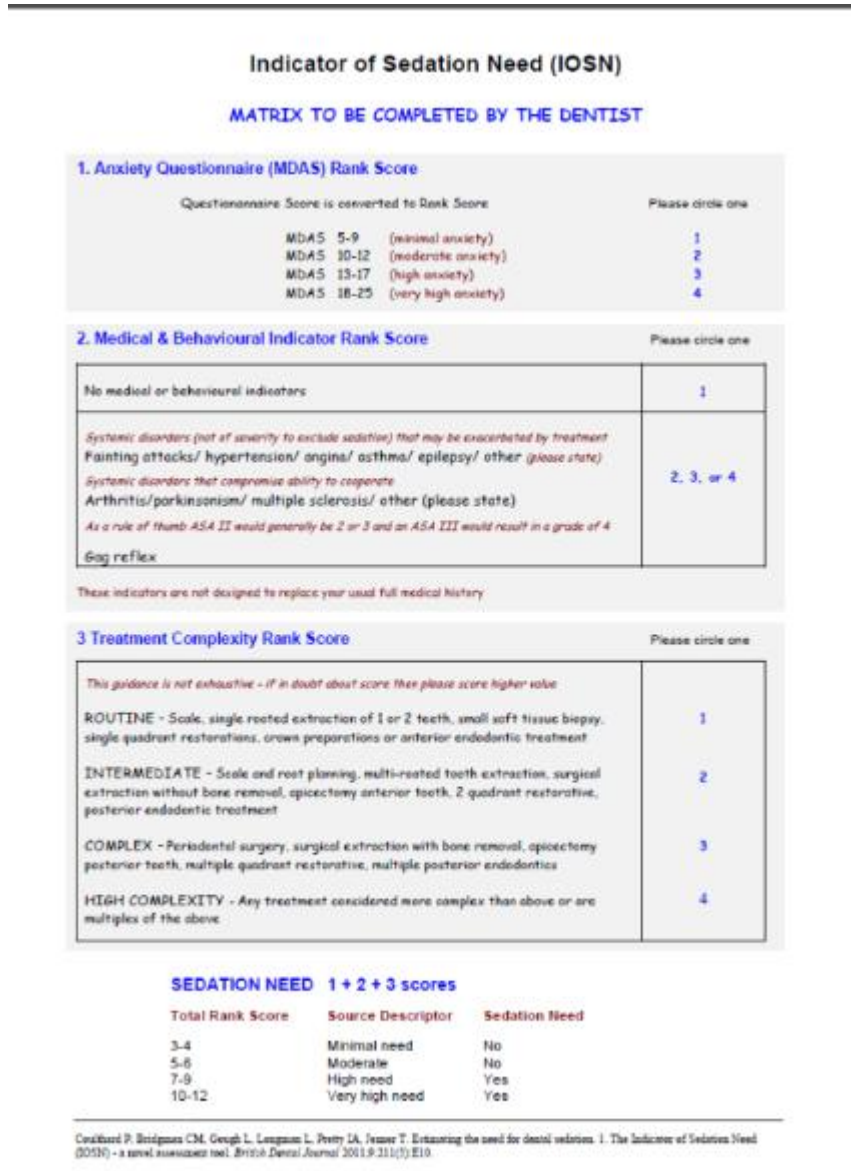
Indicator of sedation need

- IOSN developed to aid decision making

Scores:

- Patient anxiety (MDAS score)
- Medical history (ASA, gag severity etc.)
- Treatment complexity

Indicates (but doesn't define) sedation need



Indicator of Sedation Need (IOSN)

MATRIX TO BE COMPLETED BY THE DENTIST

1. Anxiety Questionnaire (MDAS) Rank Score

Questionnaire Score is converted to Rank Score		Please circle one
MDAS 5-9	(minimal anxiety)	1
MDAS 10-12	(moderate anxiety)	2
MDAS 13-17	(high anxiety)	3
MDAS 18-25	(very high anxiety)	4

2. Medical & Behavioural Indicator Rank Score — Please circle one

No medical or behavioural indicators	1
Systemic disorders (not of severity to exclude sedation) that may be exacerbated by treatment Fainting attacks/ hypertension/ angina/ asthma/ epilepsy/ other *(please state)* *Systemic disorders that compromise ability to cooperate* Arthritis/parkinsonism/ multiple sclerosis/ other (please state) *As a rule of thumb ASA II would generally be 2 or 3 and an ASA III would result in a grade of 4* Gag reflex	2, 3, or 4

These indicators are not designed to replace your usual full medical history

3 Treatment Complexity Rank Score — Please circle one

This guidance is not exhaustive - if in doubt about score then please score higher value	
ROUTINE - Scale, single rooted extraction of 1 or 2 teeth, small soft tissue biopsy, single quadrant restorations, crown preparations or anterior endodontic treatment	1
INTERMEDIATE - Scale and root planning, multi-rooted tooth extraction, surgical extraction without bone removal, apicectomy anterior tooth, 2 quadrant restorative, posterior endodontic treatment	2
COMPLEX - Periodontal surgery, surgical extraction with bone removal, apicectomy posterior tooth, multiple quadrant restorative, multiple posterior endodontics	3
HIGH COMPLEXITY - Any treatment considered more complex than above or are multiples of the above	4

SEDATION NEED 1 + 2 + 3 scores

Total Rank Score	Source Descriptor	Sedation Need
3-4	Minimal need	No
5-6	Moderate	No
7-9	High need	Yes
10-12	Very high need	Yes

Coulthard P, Bridgman CM, Gough L, Longman L, Petty IA, Penner T. Estimating the need for dental sedation. 1. The Indicator of Sedation Need (IOSN) - a novel assessment tool. *British Dental Journal* 2011;9:211(5):E10.

Indicator of Sedation Need (IOSN)

MATRIX TO BE COMPLETED BY THE DENTIST

1. Anxiety Questionnaire (MDAS) Score	
Questionnaire Score is converted to Rank Score	Please circle one
MDAS 5–9 (minimal anxiety)	1
MDAS 10–12 (moderate anxiety)	2
MDAS 13–17 (high anxiety)	3
MDAS 18–25 (very high anxiety)	4

Table 2. IOSN rank scoring for MDAS.[2]

Indicator of Sedation Need (IOSN)

MATRIX TO BE COMPLETED BY THE DENTIST

2. Medical & Behavioural Indicator Score	Please circle one
No medical or behavioural indicators	1
Systemic disorders (not of severity to exclude sedation) that may be exacerbated by treatment Fainting attacks/hypertension/angina/asthma/epilepsy /other (please state) *Systemic disorders that compromise ability to co-operate* Arthritis/Parkinsonism/Multiple Sclerosis/other (please state) *As a rule of thumb ASA II would generally be 2 or 3 and an ASA III would result in a grade of 4* Gag reflex	2, 3 or 4

These indicators are not designed to replace your usual full medical history.

Table 4. IOSN rank scoring for Medical and Behavioural Indicators.[2]

Indicator of Sedation Need (IOSN)

MATRIX TO BE COMPLETED BY THE DENTIST

3. Treatment Complexity Score	Please circle one
This guidance is not exhaustive – if in doubt about score then please score higher value	
ROUTINE – Scale, single-rooted extraction of 1 or 2 teeth, small soft tissue biopsy, single quadrant restorations, crown preparations or anterior endodontic treatment	1
INTERMEDIATE – Scale and root planing, multi-rooted tooth extraction, surgical extraction without bone removal, apicectomy anterior tooth, 2 quadrant restorative, posterior endodontic treatment	2
COMPLEX – Periodontal surgery, surgical extraction with bone removal, apicectomy posterior tooth, multiple quadrant restorative, multiple posterior endodontics	3
HIGHLY COMPLEX – Any treatment considered more complex than above or are multiples of the above	4

Table 5. IOSN rank scoring for Treatment Complexity Indicators.[2]

Indicator of Sedation Need (IOSN)

MATRIX TO BE COMPLETED BY THE DENTIST

SEDATION NEED domain 1 + 2 + 3 scores		
Total Rank Score	Source Descriptor	Sedation Need
3–4	Minimal need	No
5–6	Moderate	No
7–9	High need	Yes
10–12	Very high need	Yes

Table 6. IOSN rank totalling for sedation need.[2]

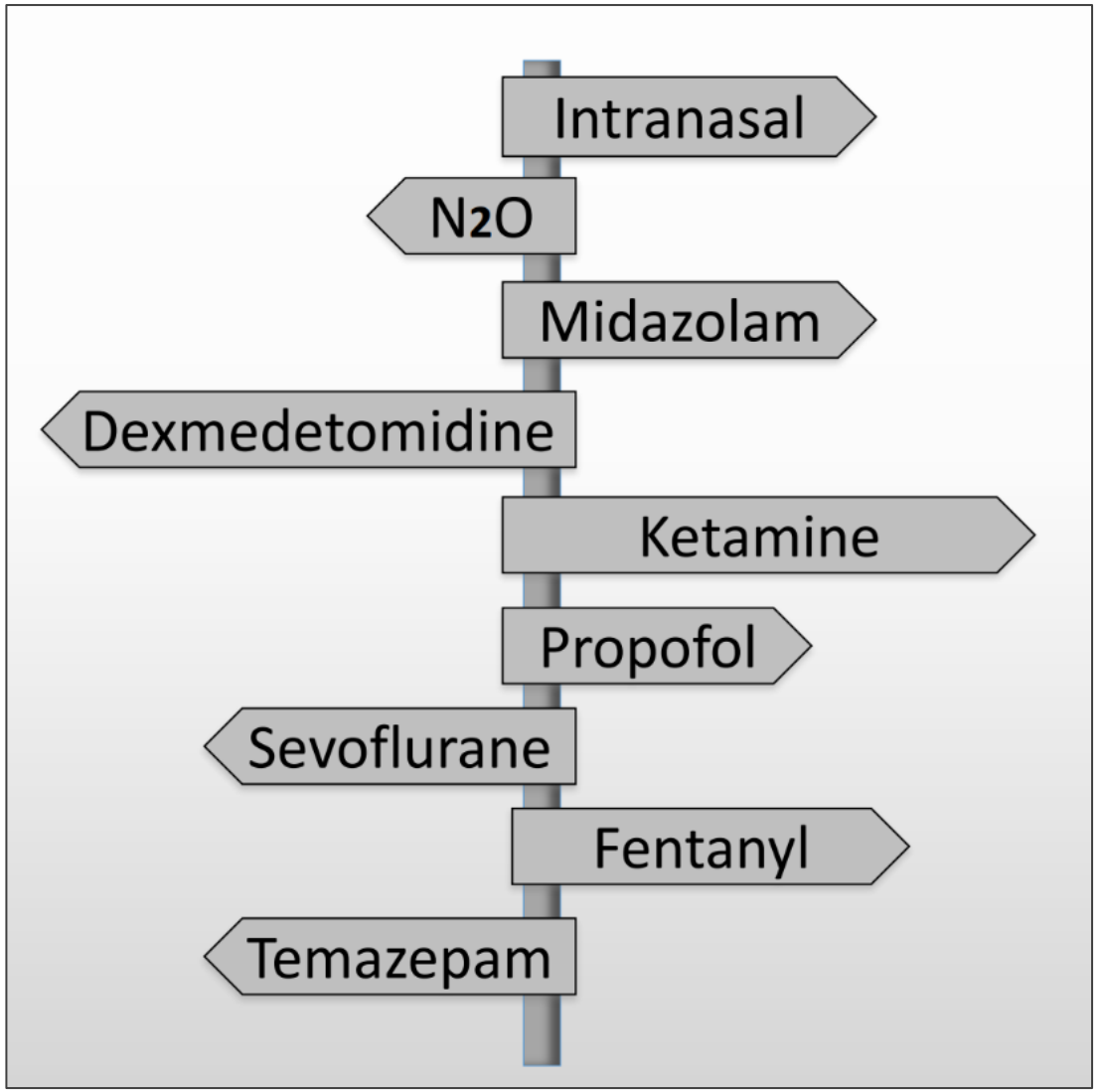
The ideal sedative

- Anxiolytic
- Analgesic
- Amnesic
- Easy (safe and simple)
- Non-irritant or toxic
- Rapid onset
- Rapid controllable recovery
- Level of sedation can be adjusted
- Sufficient duration
- No side effects/interactions/toxicity
- Predictable
- Cost effective / cheap

Choices, Choices

A variety of sedation paths
- ‘Standard/basic’; or
- ‘Advanced/alternative’

- Oral Sedation
- Transmucosal Sedation
- Intravenous sedation
- Inhalation sedation



Pre medication vs oral sedation

Oral Pre-medication

Self-administration of a small dose of an oral sedative to alleviate anxiety…usually outwith the dental setting

10-20 g Temazepam the night before appointment

5-10mg Diazepam the night before appointment

Same drug repeated one hour before

Oral Sedation

Administration much larger dose of sedative in the dental setting

Must only be carried out by practitioners who are already competent in intravenous sedation.

10-20mg Midazolam

15-30mg Temazepam

Dose reduce older adults or people who are sensitive to benziodiazapines

Oral sedation

Indications

- No cooperation for IVS / IHS
- Needle phobia

Advantages

- Stronger sedative than IHS
- Doesn't rely on compliance

Disadvantages

- Unpredictable – Bolus dose 50% bioavailability
- Increased clearance time - Anxiety slows gut motility

Long time to work

- Temazepam- 40min wait, 2-3hr peak plasma levels so long recovery
- Midazolam
- Need for subsequent cannulation
- Not titratable, no further doses
- Oral Midazolam off-licence- informed consent

Oral sedation

Indications

- No cooperation for IVS / IHS
- Needle phobia

Advantages

- Stronger sedative than IHS
- Doesn't rely on compliance

Bad taste – can only add to clear fluids unless a unit that does not fast prior to intravenous and transmucosal sedation

First pass metabolism - Liver

- Unpredictable – Bolus dose 50% bioavailability
- Increased clearance time - Anxiety slows gut motility

Long time to work

- Temazepam- 40min wait, 2-3hr peak plasma levels so long recovery
- Midazolam
- Need for subsequent cannulation
- Not titratable, no further doses
- Oral Midazolam off-licence- informed consent

Transmucosal sedation

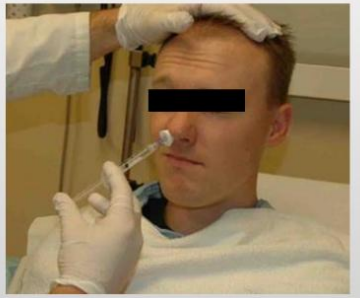
Indications

- No cooperation for IVS / IHS / Oral sedation
- Needlephobia
- Very effective alternative to GA in patients unable to cooperate:
- Learning disabilities
- Cerebral Palsy

Technique

40 mg/ml midazolam with 20 mg/ml lidocaine

- 0.25 ml administered intranasally as fine aerosol via Mucosal Atomisation Device (MAD) ~ 10mg midazolam
- Subsequent intravenous cannulation and titration of midazolam against response



Advantages

- May avoid GA
- Avoid parenteral routes (IV / IM)
- No first pass metabolism
- 70% approx. bioavailability
- Stronger sedative than IHS
- Doesn't rely on compliance

Disadvantages

- Not titratable
- Need for subsequent cannulation
- Side effects
- Sting
- Taste
- Nose bleed from blood vessel trauma
- Biphasic response (tachycardia then bradycardia)

Intranasal/intravenous sedation for the dental care of adults with severe disabilities: a multicentre prospective audit

N. J. Ransford,[1] M. C. G. Manley,[2] D. A. Lewis,[3] S. A. Thompson,[4] L. J. Wray,[5] C. A. Boyle[6] and L. P. Longman[7]

VERIFIABLE CPD PAPER

IN BRIEF

- Supports use of the IN/IV technique as an alternative to GA in adults with severe disability.
- Demonstrates its level of effectiveness in facilitating IV cannulation and treatment.
- Highlights specific training requirements.
- Potentially increases accessibility of dental treatment in primary care for this patient group and quantifies the need to retain GA facilities for those who do not respond.

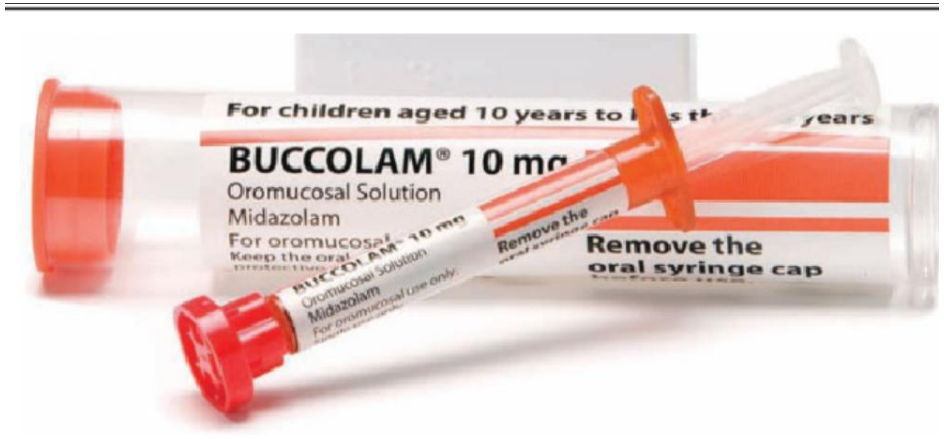
RESEARCH

78.8% treatment without difficulty

Adverse sedation events 6% - desaturation easily managed

No serious adverse incidents

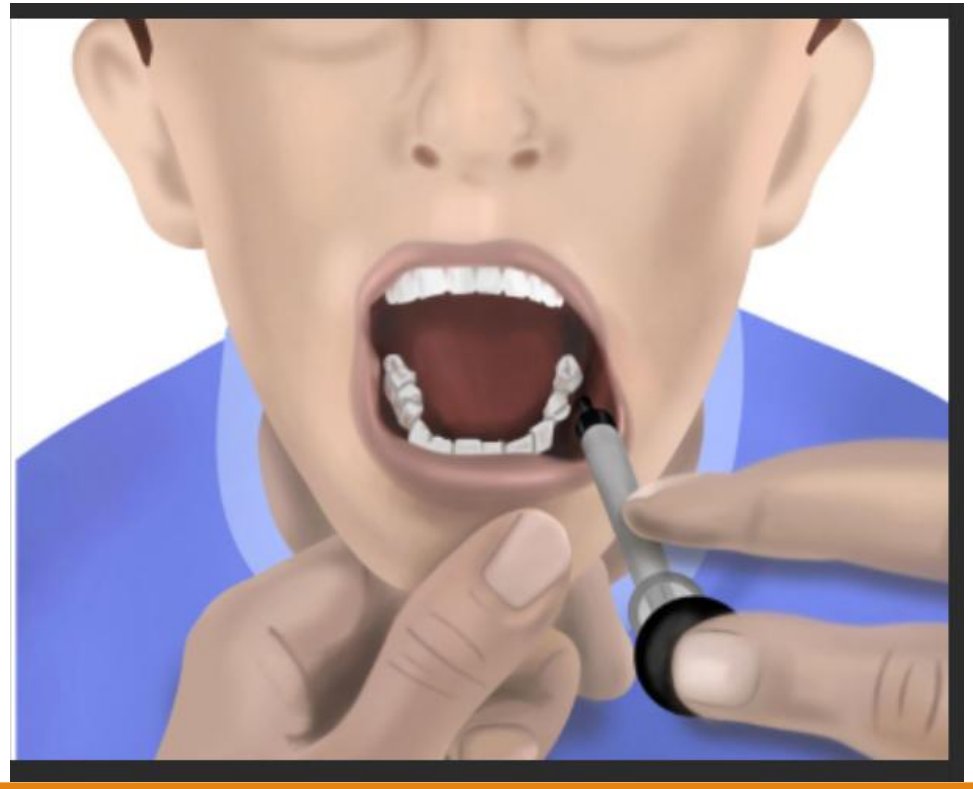
Transmucosal buccal



10mg/1ml dilution.

10mg commonly used dose except

- Dose reduction if older or sensitive to benzodiazepines



- ½ dose in left buccal sulcus.
- ½ dose in right buccal sulcus.

Intravenous sedation

Indications

- Age (>12)
- Need for amnesia
- Movement disorder
- Claustrophobia
- Anxiety level
- Gag reflex

Contra-indications – Not suitable

- Liver / renal disease (elimination)
- Disorders affected by benzodiazepines
- Myasthenia gravis, COPD, bronchitis, emphysema, poorly controlled asthma
- Pregnancy
- Breastfeeding- caution wait 8 hours
- Needle phobia – topical numbing creams, inhalation sedation for cannula
- Children (<12)

Relative contra-indications - Caution

- Severe psychiatric disease
- Cardiovascular disease- use O2 and assess without 5min post-op
- CNS depressants

- analgesics, tranquillisers, hypnotics

- may be hyper sensitive or intolerant

- Obese (Usually BMI <40)

- poor airway and venous access

- larger dose, long drug elimination

- OSA risk

- Use of non-prescribed drugs

- increased tolerance

- poor venous access if self-inject

Intravenous sedation

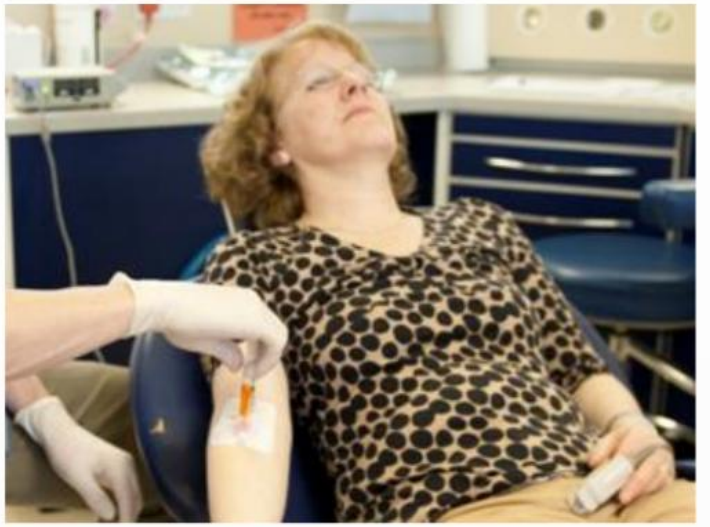
Advantages

- Titratable against response
- Rapid onset
- Maintained IV access for emergencies
- Shorter recovery than oral sedation

Disadvantages

- Venous access- ease and comfort
- Rapid onset
- Rapid side effect onset
- Monitoring
- Respiratory depression
- Escort required
- Recovery

Intravenous Sedation



Technique

- Cannulate, then flush cannula with saline

Healthy pts <60

- 1mg (1ml) increments (5mg/5ml) over 30 seconds.
- wait for start of effect 90s
- 1mg increments at 1-2 minute intervals until adequate sedation

Pts 60y+ or medically compromised

- 0.5mg-1mg (0.5-1ml) increments (2ml/2ml) over 30 seconds
- wait for start of effect 3-4mins
- 0.5-1mg increments at 3-4 minute intervals until adequate sedation

- Observe patient & assess reaction
- Flush cannula with saline

LocSIPP Checklist for Midazolam Sedation **Procedure Date: ___/___/_____**

Addressograph or

patient name and D.O.B. in writing

As applicable:	PRINT NAME	GDC / GMC No.
Clinician		
Supervisor		
Sedationist/ anaesthetist		
Nurse		

PRE-PROCEDURE (Safety Briefing)

Planned Procedure (type, site):

Med Emergency / Safety drugs check:	Y / N	Equipment Checks:	Y / N	Concerns:

SIGN IN (TICK / CIRCLE AS APPROPRIATE)

Escort / transport suitable and present	Y / N	Escort name and relationship:	
Procedure and site confirmed with pt / escort	Y / N	Written consent/ Best Interest Form checked	Y / N
Medical History confirmed with pt/escort	Y / N	Significant / relevant comorbidities	Y / N
Routine medication taken	Y / N	Premedication/anxiolysis? Drug:	Dose:
Recreational drug/alcohol in 24 hours	Y / N	Smoke in past 4 hours	Y / N
Potential airway problems	Y / N	Aspiration risk	Y / N
(If female) pregnant	Y / N	(If female) breast feeding	Y / N

Time of last meal HH:MM	:			
Fasted Y / N	Glucose drink given (if appropriate)	Y / N	ASA: 1 2 3 4	

Further details (if applicable):

Baseline/pre-administration Measurements

Pre-op NIBP: /	Heart Rate: bpm	Pre-op SPO_2: %	Blood Glucose (if applicable): mmol/l

Midazolam Concentration Checks

Method (TICK)	Concentration	Conc. Checked (INITIAL)	Dose Prepared (TICK)
Intravenous			
Oral			
Intranasal			

Resolve discrepancies before proceeding to TIME OUT

TIME OUT

Radiographs present/visible:	Y / N	Baseline measurements acceptable:	Y / N
Cannula Site:	Cannula Size:	Number of attempts (maximum of three)	
Oral Midazolam:	Time of administration	:	**Total Dose:**
Oral Midazolam:	Batch No:	Exp:	
Intranasal midazolam:	Time of Administration	:	**Total Dose:**
Intranasal midazolam:	Batch No:	Exp:	
Intravenous Midazolam:	Time of first/last increment	: / :	**Total Dose:**
Intravenous Midazolam:	Batch No:	Exp:	Cannula flushed with saline after last increment: Y / N
Saline:	Batch No:	Exp:	

Observation/Monitoring	Blood Pressure	O2 Sats (%)	Heart Rate
5mins			
10mins			
20mins			
30mins			
40mins			
50mins			
60mins			
70mins			
80mins			

Supplemental O_2 Needed	Y / N	L/min:	

Sedation Score (circle as appropriate)		Operating Score (circle as appropriate)	
1	Fully awake and orientated	1 – Good	Patient fully cooperative with optimum degree of sedation
2	Drowsy	2 – Fair	Minimal interference from the patient due to over/under sedation
3	Eyes closed, responds promptly on verbal response	3 – Poor	Operative conditions difficult due to over/under sedation
4	Eyes closed, rousable on mild physical stimuli	4 – Impossible	Treatment impossible
5	Eyes closed, unarousable on mild physical stimuli		

SIGN OUT

Post-op NIBP: / , /	Heart Rate: bpm	Post-op SpO2: %

Cannula removed:	Y / N	Post-op instructions given	Y / N / NA
Suitable for discharge:	Y / N	Time of discharge HH:MM	:
No of sharps	Disposed: Y / N	No. of Midazolam ampoules	Disposed Y / N
Discharged to:			
Recovery comments:			
Equipment Problems:	Y / N	Details (if applicable)	

Clinician:	Signature:	Date:
Checked by:	Signature:	Date:

Debrief (If required)

Please ensure this checklist is signed and filed / scanned into the patient notes.

Inhalation sedation

Indications

- Gagging
- Needle phobia
- Benzodiazepines contra-indicated
- All age groups
- Medical conditions
- IHD and cerebrovascular disease
- Liver and kidney disease
- Asthma
- Epilepsy

Contra-indications

- Blocked nasal airway
- Chronic obstructive airways disease- hypoxic drive
- Claustrophobia
- Pregnancy (2nd trimester in emergency)
- Severe learning difficulties
- If incapable of understanding procedure
- Severe or uncontrolled systemic disease
- Myasthenia gravis
- Eye / middle ear surgery
- Vitamin B12 deficiency/ bone marrow suppression – untreated
- Severe psychiatric disorders

- Unpredictable response if psychotic / schizophrenic

- N_2O can result in dreaming / fantasies / hallucinations

Advantages

- Oxygen provision (30% minimum)
- Non-invasive
- Rapid absorption
- Initial clinical effects (2-3 mins)
- peak effects (3-5 mins)
- easily titratable / discontinued
- minimal impairment of reflexes
- analgesia produced

Disadvantages

- Maxillary anterior region
- Need to nose-breathe
- Capacity to comply
- Physical ability (i.e.nasal polyps)
- Air spaces (e.g retinal repair)
- Less potent than IVS
- Equipment space and cost
- Operator control- mouth breathing
- Technique sensitive
- Staff exposure

  Environmental

Pharmacology

Pharmacodynamics

- How a drug works.
- How a drug affects us.
- The relationship between dose and effect.

‘How a drug affects the body’

Pharmacokinetics

- Absorption.
- Distribution
- Elimination

‘How the body affects the drug’

Pharmokinetics

Sedative drugs can be administered:

- Orally as tablet or liquid
- Transmucosally via buccal, nose or rectum.
- Intravenously
- Inhalationally

Absorption leads to the presence of drug in the bloodstream and then transport to its site of action (CNS)

Terms explained….

Half-life (t1/2) is defined as the time required for the plasma concentration of a drug to decrease by half

Types of half life

alpha (α) - half-life represents the initial rapid decline in plasma concentration due to distribution

beta (β) - half-life represents the slower decline due to elimination

How does sedation work - background

GABA Gamma-Amino-Butyric Acid (GABA) is the most important brain neurotransmitter

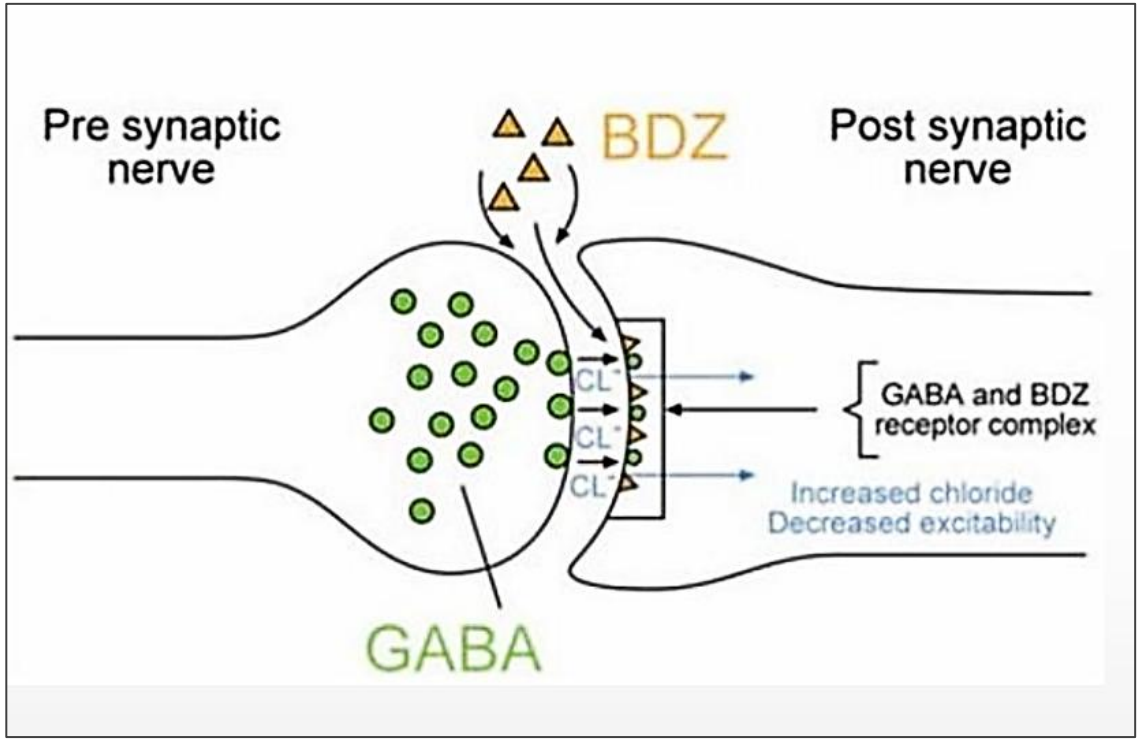
When it binds to GABA receptors in the brain (cerebral cortex) it stimulates opening the ‘gate’ to chloride ions in plasma

Chloride flows into the cell

- It makes the cell less responsive to stimulation

- Inhibits nerve transmission

- Calming effect



Benzodiazepines

Benzodiazepines bind to post-synaptic receptors near GABA receptors in brain and spinal cord

Influence the effect of GABA

- Enhance GABA causing sedative effect

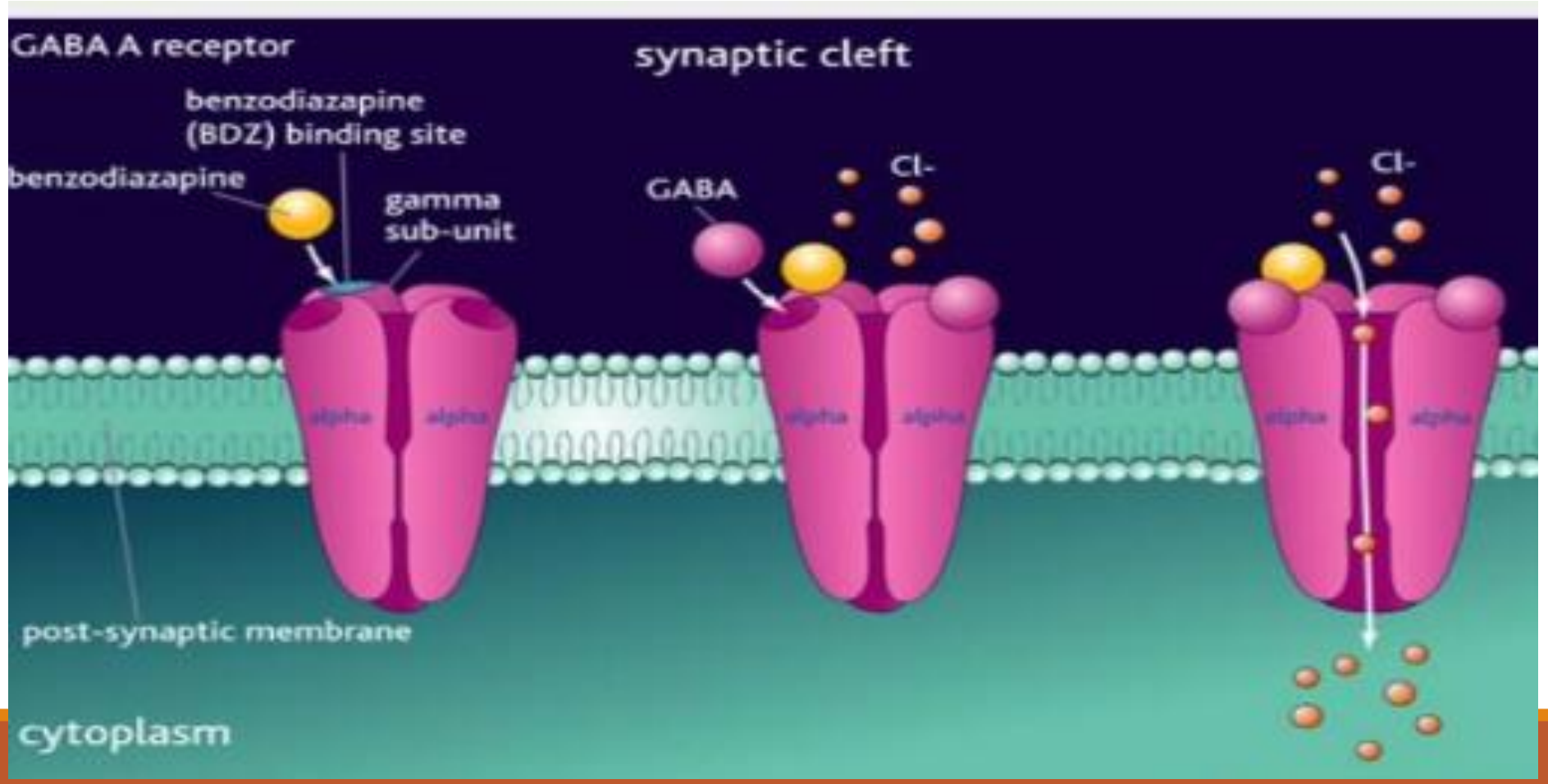
Terms

Agonists

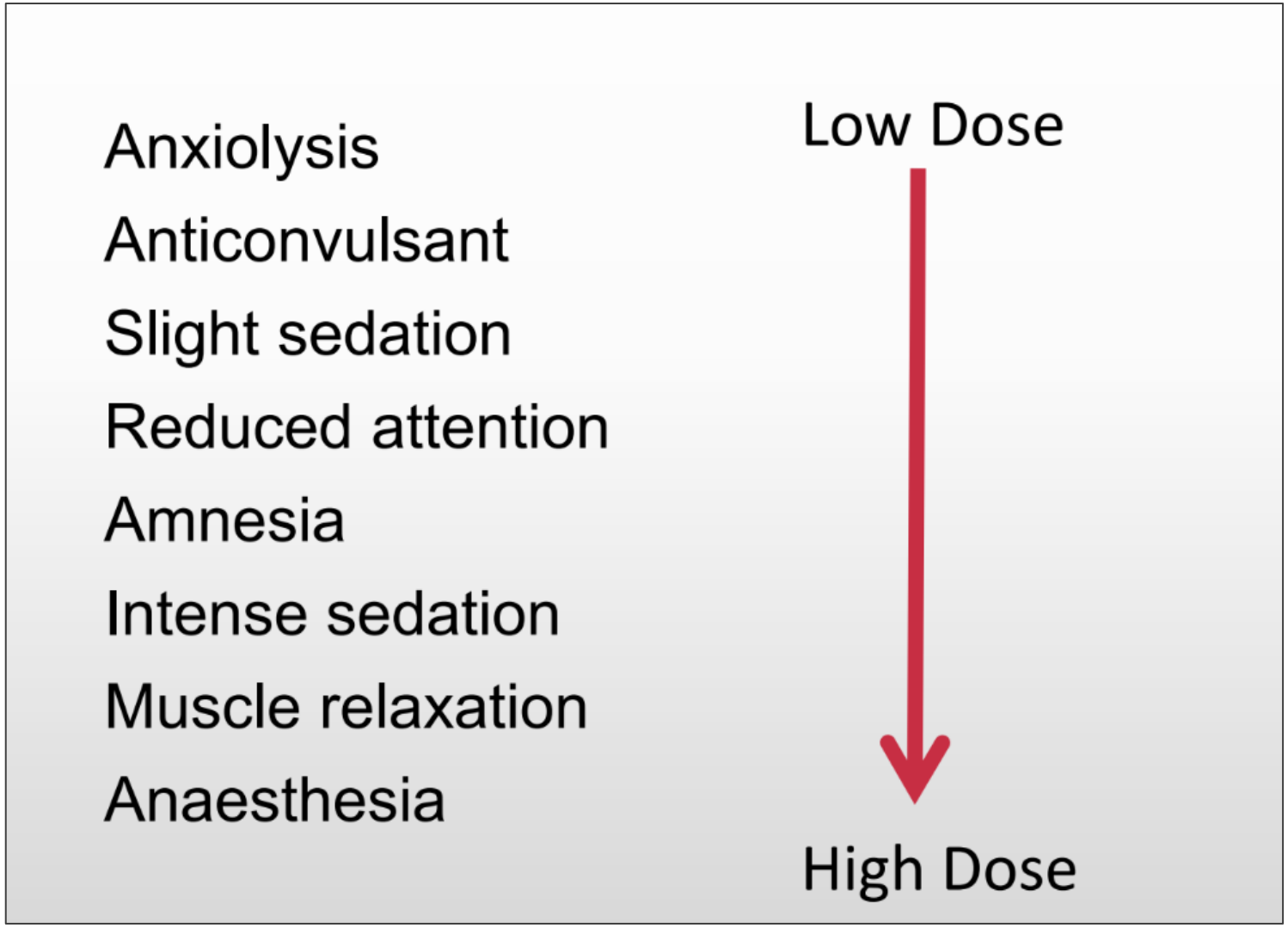
– encourage GABA

Antagonists

- reverse GABA



Benzodiazepines clinical effect



Benzodiazepines clinical effect

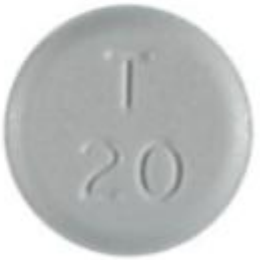
Anxiolysis – Early onset very beneficial.

- Anticonvulsion – Beneficial for epilepsy.
- Sedation – Depressed level of consciousness and response. Helpful, but not too much
- Amnesia – Anterograde (after the start) and prevents remembering rather than loss of memory. Unpredictable.
- Muscle relaxation – Not ideal. But very useful for Parkinsonian tremors.
- Anaesthesia- Takes a lot (21mg for 70kg man).

Side Effects of Benzodiazepines

- Respiratory depression- Due to CNS depression by reducing response to CO_2 build up *and* muscle relaxation.
- Sexual fantasy.
- Cardiovascular – small drop in BP can result in small increase in HR.
- Drug interactions – alcohol, CNS depressants, propofol.
- Tolerance- repeated exposure decreases effect. Probably due to reduced receptor response rather than liver induction.

Temazepam

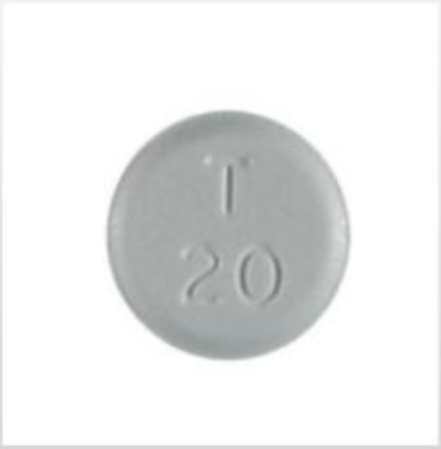


- Oral medication for anxiolysis.
- Must be prescribed as tablets.
- Class C controlled drug.
- 10mg-40mg in past as oral sedative. 50% lost on first pass metabolism
- Current prescribable dose in BNF 15-30mg (2/3 that range for premed).
- Written consent.
- Superceded by oral midazolam better for special care patients.
- Escort.

Temazepam

Properties

- Metabolite of Diazepam
- $GABA_A$ receptor agonist (enhances)
- t1/2β 5-11h
- Peak effect 30-45mins after taking
- 45mins clinical sedation



Sedative Action

- $GABA_A$ receptor produces anxiolysis
- Initial detachment then psychological relaxation
- Muscle relaxation
- Anticonvulsant
- Minimal cardiovascular / respiratory depression
- *Antero*grade amnesia
- Metabolised by liver
- Excreted by kidneys

Midazolam

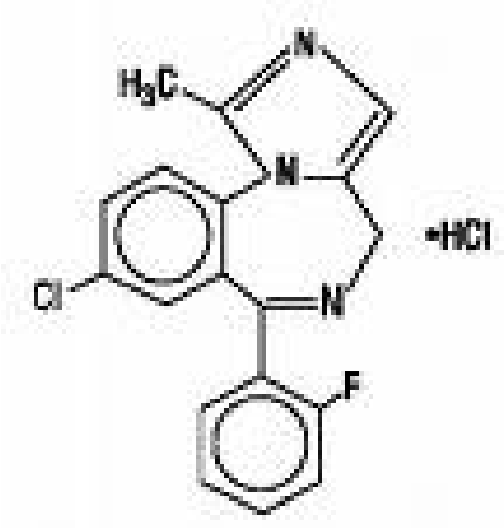
Mainstay of conscious sedation

Available in 3 preparations

- **1mg /ml (5ml amp)**
- 2mg / ml (5ml amp) (no longer used)
- 5mg / ml (2ml amp) (NEVER!!)

Rapid onset

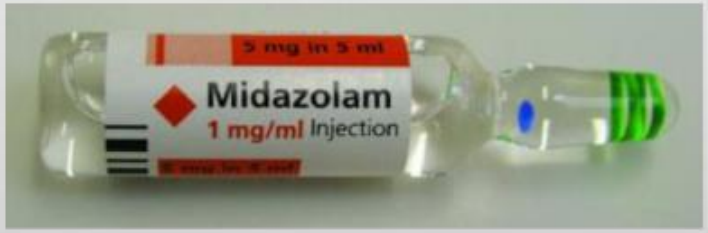
Reversible



Midazolam

Properties

- Water soluble becomes lipid soluble at body pH. Non-irritant
- $GABA_A$ receptor agonist (enhances)
- t1/2α 15-30min
- t1/2β 1.5-2.5h (up to 4x in >60y)
- No rebound sedation from metabolite as t1/2β shorter than midazolam
- 1mg/ml as 5ml or 2ml ampoules for IVS



Sedative Action

- Cortex $GABA_A$ receptor produces anxiolysis
  - Initial detachment then psychological relaxation
- Brainstem and medulla Glycine receptors
  - increased effect causes anxiolysis and muscle relaxation
- Anticonvulsant
- Minimal cardiovascular / respiratory depression
- *Antero*grade amnesia
- Metabolised by liver, excreted by kidneys

Midazolam

Side effects

- Cardiovascular- reduced peripheral resistance so increased pulse
- Respiratory depression- care on over-sedation, age, additional CNS depressants
- Tolerance l/term- difficult to sedate patients on Diazepam
- Fantasy and disinhibition- NEVER leave the surgery with <2 staff members at a time.

Diazepam

Historic IV sedation
Diazemuls 5mg/ml (2ml ampoule)
Premedication 5/10mg night before and 1 hour before

Properties of IV Diazepam

- Emulsified in soya-bean oil
- Less irritant than valium
- $GABA_A$ receptor agonist (enhances)
- t1/2α 40min
- t1/2β 30-56h
- 5mg/ml

Sedative Action and Side Effects of IVD

- Same as Midazolam
- Less predictable anterograde amnesia
- Less comfortable on injection
- Rebound sedation from metabolite in following 72hrs (drug and metabolites stored in gall-bladder)

Flumazenil

Properties

- Water soluble.
- Non-irritant
- $GABA_A$ receptor antagonist (reverses)
- t1/2α 7-15min
- t1/2β 40-80min (unaffected by age)
- Theoretical rebound sedation from initial benzodiazepine as t1/2β shorter

Sedative Action

- Binds to receptors but effectively inactive
- Reverses sedative, cardiovascular and respiratory effects of benzodiazepines
- DOES impair cognition and effect CVS itself

Technique

- 200mcg (2ml); wait 1 min.
- 100mcg (1ml) if no effect; wait 1 min.
- Repeat 100 mcg increments up to max dose of 1g (2 x 500mcg ampoules)
- Usual dose 300-600mcg

Nitrous Oxide

Properties

- Colourless, mildly sweet-smelling gas. 3rd largest greenhouse gas
- Long track record (first used 1844)
- Heavier than air (approx 1.5 x)
- Low solubility- rapid induction and reversal.
- MAC 110 so v. weak- almost impossible to => GA.
- Minimal metabolism (0.0004%)

Sedative Action

- NMDA receptor antagonist produces dissociation and euphoria
- $GABA_A$ receptor agonist produces anxiolysis
- Endogenous opioid receptors in brain and α2-adrenoceptors in spinal cord produce analgesia
  - 50% N_2O = standard 10mg morphine injection
- Minimal cardio-respiratory depression

Consider the environment before giving anaesthetic gas to women during childbirth, Irish midwives say

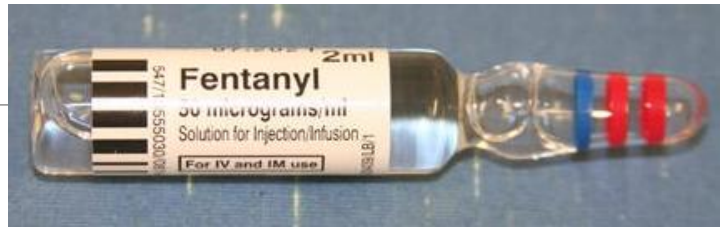
A majority of midwives believe the harmful effect of nitrous oxide on the environment should be taken into account when deciding whether to give it to women when they give birth, a new study has found


PORTER
NITRONOX

Advanced sedation techniques

Multi route

Multi-drugs



Sevoflurane

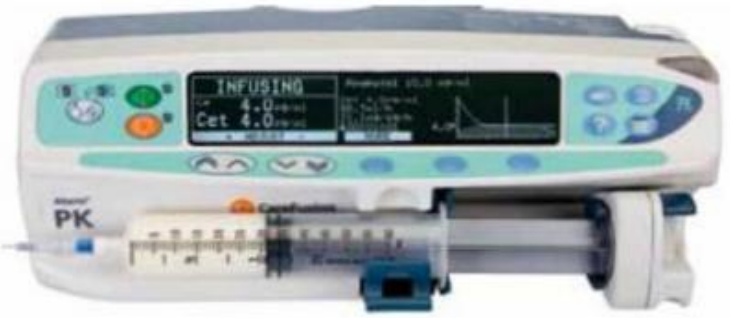
Properties

- Sweet smelling gas
- Anaesthetic agent
- MAC 1.8 (Significantly more potent than N_2O- MAC 104)
- Decrease BP
- Relaxes bronchial muscle
- Reduced sensitivity to low O2 and high CO2
  - Decreased respiratory rate
- Little analgesia
- Used alone or with N_2O (SNICS)

Sedative Action

- Exact action unclear
- $GABA_A$ receptor- reduced anxiety
- Antagonise NMDA receptors- dissociation and euphoria
- Reduces channel opening times / increases closing times

Propofol (Diprivan)



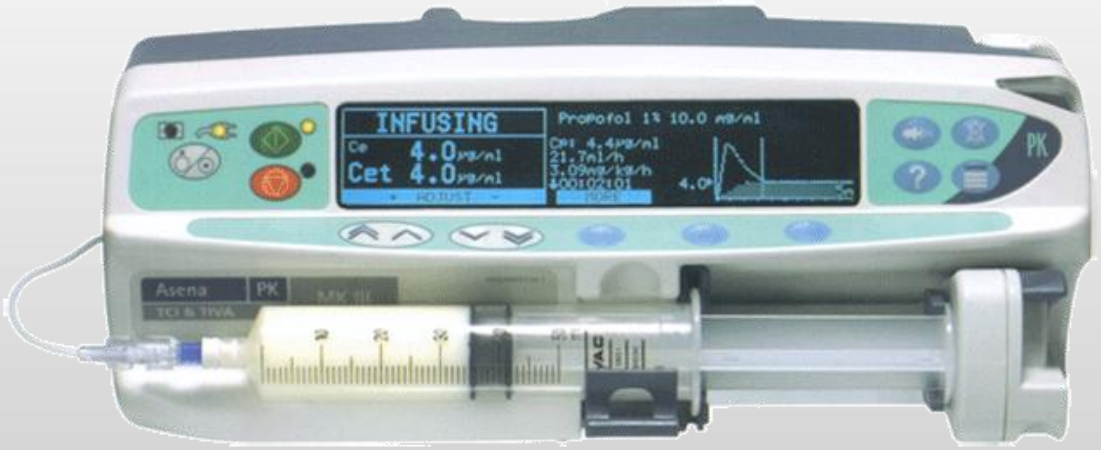
Properties

- White liquid “Milk of Amnesia”
- Anaesthetic agent.
- Lipid-soluble so 1 or 2% in emulsion with soya bean oil and egg phosphatide
  - Pain on injection
- Reduces BP by up to 35%
- Respiratory depression at anaesthetic but not sedative doses
- Unpredictable amnesia,
- No analgesia
- Convulsant AND anti-convulsant effects
- Disinhibition
- "Feel nice"
- Rapid onset, short duration
- T1/2α 2-4min
- T1/2β 30-40min
- Target-Controlled-infusion (TCI) or Patient-Controlled Target Infusion using computer-driven pump. Usually fit for discharge 15mins post-op.
- Safety margin from CS-GA narrower than BZDs

Propofol (Diprivan)

Sedative Action

- Enhances duration of $GABA_A$ by decreasing GABA dissociation at a different site to BZDs (β sub-unit)
- Possibly involves endocannabinoid system



Fentanyl

Synthetic opioid

- 90 X more potent than morphine
- Most often used in conjunction with second agent i.e. propofol or ketamine.
- Powerful analgesic.
- CNS depressant
- Nausea can be a risk when used alone.
- Remifentanyl; alfentanyl shorter acting but more potent agents

MDT pre-assessment

Belfast Health and Social Care Trust

caring supporting improving together

Well established joint service in our DPU

All new patients are reviewed face to face

- RGN and dental nursing team
- Special care dental consultants and trainees
- Consultant anaesthetist

Undertake electronic care record / encompass review

Investigations ordered if needed, if able

Allow for familiarisation of unit for patient and carers

Decision for capacity, best interest meetings

Role of MDT

- To confirm treatment plan where possible
- Assess behaviour , cooperation and compliance of patient
- Plan for IV sedation or GA or LA monitoring only
- No treatment – palliative approach discharge to referrer
- Discuss with patient and carers
- Other specialist dental opinion / input
- Other medical specialist advice
- Identify small cohort of highest risk patients unable to treat in DPU

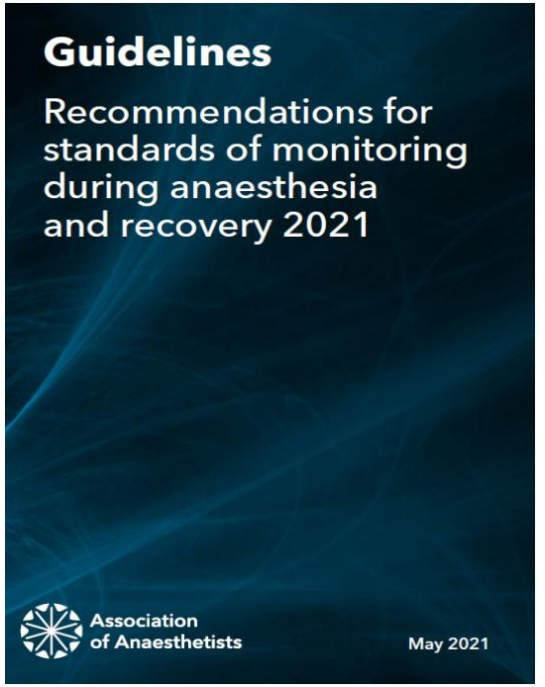
Anaesthetic Team supporting SCD

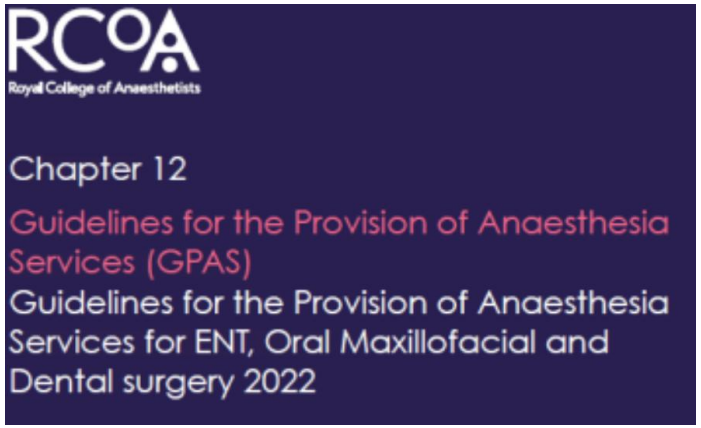
5 anaesthetists, 4 consultants and 1 SAS doctor

- Involved from first face to face assessment with dentist
- Discuss cases
- Help coordinate care,
- Safety briefs, debriefs, reflective practice

Governance

- Care pathways, Insulin dependent DM, Difficulty Airway,
- Emergency protocol
- Unexpected admissions,
- Critical incidents, shared learning,
- Vocera connection to emergency team





Anaesthetic Team supporting SCD

Training and Education

- Insitu simulation
- Multi disciplines
- Failed intubation drills

Difficult Airway Society

Home / Publications

DAS Guidelines

Resources

- Ensure up to date
- Airway equipment, AmbuScope Fibre Optic intubation,
- Oxford pillow
- Appliances for TIVA, BIS monitor

Perioperative Medicine

MDT is “Foundation of perioperative care”

Anaesthetist is Perioperative physician

Patient-centered

Continues to evolve and improve

Strong team collaboration

Support from other specialists

……close working relationship is needed between the dental team, the anaesthetist and the other multidisciplinary teams involved.

Perioperative Medicine

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Anaesthetist is Perioperative physician

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……close working relationship is needed between the dental team, the anaesthetist and the other multidisciplinary teams involved.

Suitable escort (s)
Getting to the building
Getting into the building
Risk assessment behaviour challenge
Premedication
Ametop / emla cream
Manual handling aids
Sensory toys / music / videos
Induction – IV vs gas
Recovery

Promote use of anaesthetic led IV sedation vs GA

Procedural Sedation

….airway patency, spontaneous respiration, protective airway reflexes, and hemodynamic stability are preserved, while alleviating anxiety and pain'

Ensuring competencies for target state and unplanned deeper state

Academy of Medical Royal Colleges

February / 2021

Safe sedation practice for healthcare procedures

An update

Standards for Conscious Sedation in the Provision of Dental Care (V1.1)

Report of the Intercollegiate Advisory Committee for Sedation in Dentistry

2020 | The dental faculties of the royal colleges of surgeons and the Royal College of Anaesthetists

Promoting safer practice with IV Sedation

High Flow Nasal Oxygen

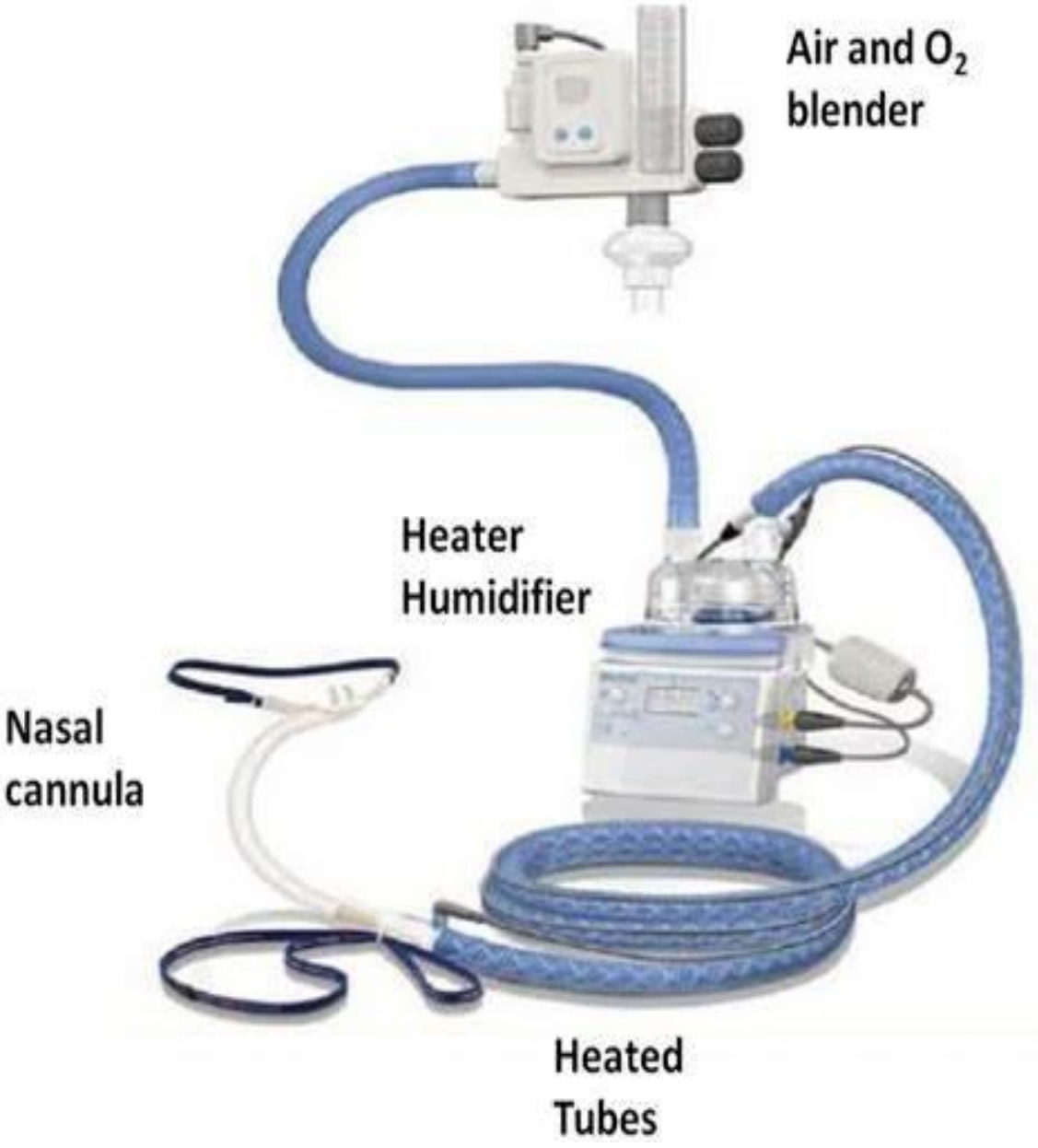
HFNO is warm, humidified oxygen

Delivery of Oxygen at high flow
- rates up to 60 l/min

Continuous positive pressure in airways

Reducing work of breathing

Improves gas exchange
- Improves oxygenation
- Effective CO2 elimination



High Flow Nasal Oxygen

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Delivery of Oxygen at high flow

- rates up to 60 l/min

Continuous positive pressure in airways

Reducing work of breathing

Improves gas exchange

- Improves oxygenation
- Effective CO2 elimination

Outcomes

Fewer complications post op (PONV, delirium)

Shorter recovery time

Shorter time to discharge .

No unexpected hospital admissions

Reduction in number of referrals for high risk patients needing treatment as in-patient and provision of care main theatre suite

High flow nasal oxygen: impact on anaesthetic service delivery in Special Care Dentistry

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TMS Data review 2015-2018

30% increase in cases treated in DPU in 2016 & 2017 from 2015

60% increase in total number in 2018 from 2015

Reduction under GA by 50%

Increase in number of sedation cases compared to GA ($P<0.001$)

Increasing choice of anaesthesia technique

Reduced inpatient referral

Improved access to care for patients

Improved outcomes for patients

Allows 'normalising' of dental treatment

Allows for better treatment planning and communication

Positive feedback from patients

Practical indications HFNO

Reduced reliance on GA for EUA

- History unclear e.g. vague pain history, cannot assess
- Use IV sedation HFNO for dental assessment

Older people – greater medical comorbidities not suitable for GA

Respiratory comorbidities

- Cystic fibrosis
- OSA

High BMI

Can facilitate deeper sedation to achieve level of co-operation required

Management with difficult airways for GA pre and post op oxygenation

Anaesthetic challenges IV sedation in SCD

Patient – IV access

Shared Airway

Fasting status

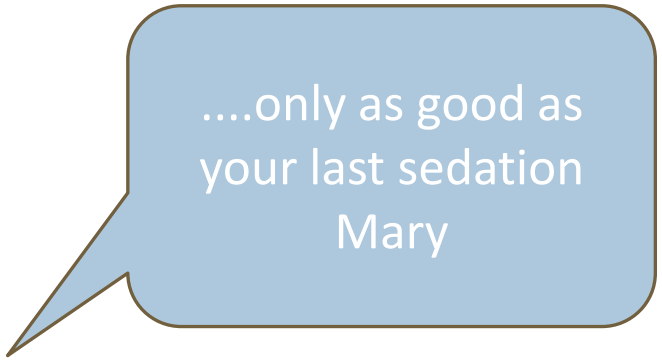
Risk of aspiration

Dentist airway skills

Trust between dentist and anesthetist

It is harder work than GA

Remote site working



Dental challenges with anaesthetic led IV Sedation

‘Sweet spot’ between over sedated & level of co-operation

Doing chin lift or jaw thrust by while taking out teeth!

Coughing and gag with water

Added equipment in theatre

Success relies on teamwork, communication & trust between dentist & anaesthetist

Not always a substitute for GA

Treatment provided

Comprehensive dental treatment

- Exam
- BPE
- Radiographs
- Fillings
- Extractions
- Root canal treatments *
- PMPR
- Topical Fluoride varnish application

Joint non dental procedures:

- Blood investigations (needs to be requested by GP or medical professional)

Other medical specialities

- Podiatry
- ENT
- Urology
- Audiology

Summary

- Simple tools aid anxiety/pain/distress assessment in SCD patients
  - Dental anxiety and phobia have a variety of causes
  - The signs and symptoms of dental anxiety and phobia are due to FoF
  - A range Anxiety Management Techniques exist, mMost build on good patient management
  - A variety of Conscious Sedation agents and techniques are available
  - Pre-medication is NOT the same as oral sedation
  - GA has a place in Special Care Dentistry, but the need has significantly reduced due to advances in Conscious Sedation

Any Questions?

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