State of New York
Office of Mental Retardation and Developmental Disabilities

OMRDD ALERT

Preventing Dental Catastrophes Through Proper Use of Anesthesia

ATTENTION: DENTAL / MEDICAL PERSONNEL

The ADA guidelines for the Use of Conscious Sedation, Deep Sedation and General Anesthesia for Dentists clearly defines the training, emergency drugs and equipment necessary to safely manage emergencies related to those modalities in the dental office. All dentists in NYS using these techniques are strongly urged to consult NYS Practice Memorandum: 2000.3.

George E. Pataki
Governor

Thomas A. Maul
Commissioner

Each year medical emergencies culminating in death or serious injury do occur as a result of dental treatment

ndividuals with developmental disabilities are at greater risk than the general population for having severe medical emergencies during or after dental procedures

This **ALERT** was generated from past experiences and literature review and is issued by the **Office of Internal Affairs of the NYS Office of Mental Retardation & Developmental Disabilities.** t is our responsibility to review all terminal events and quality of care issues relative to individuals eceiving services from OMRDD. Actual case findings are held in confidence. It is critical to inform racticing dentists of adverse occurrences that may have happened so as to help avoid them in the future.

Medical History:

A reliable, thorough medical history including medications taken and pre-existing medical conditions nust be available to the dentist. Dentists should consult with appropriate medical practitioners when needed. A thorough pre-operative medical workup can prevent catastrophes.

EXAMPLE: 40% of individuals with Down's Syndrome have cardiac malformations and may need an echocardiogram to determine the extent of the problem and if SBE prophylaxis is indicated.[1]

Local Anesthesia:

Whenever dental procedures are performed, local anesthetics should be considered the anesthetic of choice. If a consumer is extremely anxious or uncooperative, a **behavior modification/desensitization** program should be developed to enable him or her to better tolerate dentistry under local anesthesia.

Dentists must be aware of **medical conditions in which the use of local anesthetic with vasoconstrictor is contraindicated** (either due to the anesthetic, vasoconstrictor or the inclusion of a bisulfite preservative). Medical conditions of concern include (but are not limited to):

- Allergy to local anesthetic
- Uncontrolled diabetes
- Sulfite sensitivity
- Various forms of heart disease including a recent history of myocardial infarct, refractory arrhythmias, or uncontrolled severe hypertension.
- Pheochromocytoma
- Steroid-dependent asthma

"For optimal patient safety, dentists **must recognize potential drug interactions involving adrenergic vasoconstrictors** and modify their use accordingly." "**Vasoconstrictor drug interactions** involving tricyclic antidepressants (TCAs), nonselective B-adrenergic blocking drugs, certain general anesthetics* and cocaine are well documented in both humans and animals as having the potential for causing serious morbidity or death."[2] (*i.e. halothane).

In consumers taking TCAs the use of local anesthetics with norepinephrine or levonordefrin as well as the use of retraction cord with epinephrine is dangerous and contraindicated. The use of local anesthetics with epinephrine in patients taking TCAs should be avoided if possible and used with extreme caution when necessary. According to Stanley Malamed, "Patients receiving epinephrine-containing local anesthetics should be administered the smallest effective dose. Yagiela et al recommended limiting the epinephrine dose to patients receiving TCAs in a dental appointment to 0.05mg or 5.4ml of a 1:100,000 epinephrine concentration."[3]

Dentists must be aware of possible interactions between phenothiazines and epinephrine. "[The] accidental intravascular administration of a vasopressor-containing local anesthetic could lead to hypotension in patients receiving phenothiazines. Local anesthetics containing vasopressors are not contraindicated in patients taking phenothiazines; however it is recommended that *the smallest volume of vasopressor-containing local anesthetic that is compatible with clinically adequate pain control be administered.*"[4]

Syncope is the most common reaction to local anesthesia injections and patients must be monitored after their administration. It is critical to maintain appropriate body alignment (open airway and feet above heart) in the event of a syncope reaction. The goal is to **prevent positional asphyxia and aid blood flow to the brain** so that this relatively minor emergency does not become catastrophic.

A toxic dose of local anesthetic agents and/or vasoconstrictors must be avoided. Common causes for local anesthetic toxicity include:[5]

a) Excessive dose is administered for the size of the individual
b) The injection is too rapid
c) Intra-vascular injections
d) Significant liver or renal impairment

Dentists should consult literature on maximum dosage recommendations for each local anesthetic and vasoconstrictor.

Sedation:

Links between physical restraint and sudden death have been reported and it is at times prudent to consider use of some type of sedation to perform dental procedures.

Dentists must be aware that "confounding effects of medications being taken by the patient may increase the risks associated with sedation and general anesthesia" and that "drugs that depress the central nervous system produce a progressive dose-related continuum of effects."[6]

	Airway	*Arousal*	*Reflexes*
Conscious sedation	Independent airway	Responds to verbal command	Protective reflexes intact
Deep sedation	May be impaired	More difficult to arouse patient	Depressed protective reflexes
General anesthesia	Dependent airway	Unconscious patient	Complete loss of protective reflexes

"When sedative or anesthetic drugs are used, the exact technique can be further described by specifying route of administration, agents used and their dosage."

"The amount of training, experience and skill needed to safely produce and manage CNS depression increases with the degree of depression involved."[7]

- **Hypoxia,** as a result of failure to maintain an airway and/or "overdose" of anesthetic agents, is the most common cause of cardiac arrest. **Airways must always be secured and maintained.**
- Airway evaluation including **Mallampati classification** should be determined to ascertain the state of an airway especially in consumers who have unusual anatomic variations.
- It is always preferable to have **secure IVs prior to initiation of a sedative.** If this is not possible, a plan for safely establishing an IV and securing the airway must be in place prior to the initiation of care.
- Inhalation anesthetics (particularly Halothane) may lower the threshold for arrhythmias by sensitizing the myocardium. Halothane may also prolong the QT interval leaving the patient vulnerable to torsades de pointes that can lead to cardiac arrest. Many drugs have been linked to Long QT Syndrome (LQTS) including TCAs, certain nonsedating antihistamines and several antipsychotics. LQTS prolonging agents may enhance the adverse/toxic effects of other LQTS medications. Updated information about drugs that can cause LQTS can be found at **www.Qtdrugs.org.**
- In consumers **with known GERD, clear aqueous antacids should be administered** prior to anesthesia to raise gastric pH.

Emergency Management

As health care providers, dentists must be prepared to **recognize and properly manage patients who are experiencing medical emergencies** in the dental office. The failure to do so may lead to a cascade of events that may result in the injury or death of the patient that could otherwise be prevented.

The ADA guidelines for the Use of Conscious Sedation, Deep Sedation and General Anesthesia for Dentists[8] clearly defines the training, emergency drugs and equipment necessary to safely manage emergencies related to those modalities in the dental office. All dentists using these techniques are strongly urged to consult their own state's requirements for specific emergency drugs and equipment.

[1] David Smith and Ann Asper Wilson, The Child with Down's Syndrome (Philadelphia: WB Sanders, 1993) 30.
[2] Yagiela DDS PhD, John A, "Adverse Drug Interactions in Dental Practice: Interactions Associated with Vasoconstrictors Part V of a series." *JADA* Vol. [illegible] May 1999 p. 701
[3] [illegible]amed D.D.S., Stanley F., Handbook of Local Anesthesia. Fourth edition. Mosby books. 1997, p124
[4] [illegible]amed D.D.S., Stanley F., Handbook of Local Anesthesia. Fourth edition. Mosby books. 1997, P125
[5] Adapted from Malamed D.D.S., Stanley F., Handbook of Local Anesthesia. Fourth edition. Mosby books. 1997,Chapter 18.
[6] 50. Anesthesia and Sedation in the Dental Office. National Institutes of Health Consensus Development Conference Statement April 22-24, 1985
[7] 50. Anesthesia and Sedation in the Dental Office. National Institutes of Health Consensus Development Conference Statement April 22-24,1985
[8] American Dental Association. Guidelines for the use of conscious sedation, deep sedation and general anesthesia for dentist. Chicago: ADA; 2000. Available at: www.ada.org/prof/ed/guidelines/index.html

You are encouraged to copy and disseminate the information contained herein to the appropriate medical/dental personnel in your area.
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Further information about New York State's supports and services for individuals with mental retardation and developmental disabilities may be found on our web site located: **www.omr.state.ny.us**

or

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