British Columbia Dental Association

PROTOCOL FOR MEDICAL EMERGENCIES

#I - ANAPHYLAXIS/ALLERGY RESPONSE

If response mild (e.g. itching without skin changes or swelling) -
Diphenhydramine *(Benadryl)* 25 - 50mg. p.o.
Children's dose 1 - 1.5mg/kg

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If symptoms progress or are rapid (e.g. bronchoconstriction/wheezing, rash/wheals, swelling), activate Emergency Medical Services (EMS).

Administer oxygen 5 - 10L/min. by face mask
Epinephrine 1:1000 0.3 - 0.5ml subcutaneously
Children's dosage 0.01ml/kg

If patient's status continues to deteriorate and waiting for ambulance, repeat Epinephrine every 5 minutes as required to control symptoms.

Diphenhydramine *(Benadryl)* 50mg deep intramuscular (IM) or IV
Children's dosage 1 - 1.5mg/kg
Hydrocortisone Succinate *(Solu-Cortef)* 100mg deep IM or IV
Children's dosage 2 - 3mg/kg

Hydrocortisone will not help to stabilize the patient immediately, but will prevent recurrence and block late phase reactants. May not need to administer if transport to emergency facility is expedient.
Patient may require positive pressure ventilation if becoming cyanotic or loses consciousness.
Use bag/valve/mask or Laerdal mask with oxygen inlet at 10L/min.

If trained in Advanced Cardiac Life Support (ACLS), Advanced Trauma Life Support (ATLS) or Pediatric Advanced Life Support (PALF), use appropriate protocol, intubation/surgical airway and intravenous medications when indicated.

II - ACUTE ASTHMA ATTACK/STATUS ASTHMATICUS

Salbutamol *(Ventolin)* inhaler – 2 puffs
Children's dosage - 1 puff
Consider use of Aerochamber/spacer to improve administration.

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If symptoms progress or are rapid in development, activate Emergency Medical Services (EMS).

Administer oxygen 5 - 10L/min. by face mask
Epinephrine 1:1000 0.3 - 0.5ml subcutaneously
Children's dosage 0.01ml/kg

Can repeat Epinephrine in 10–15 minutes if waiting for ambulance and patient still has significant wheezing.

Hydrocortisone Succinate *(Solu-Cortef)* 100mg deep intramuscular (IM) if delay in transport.
Children's dosage 2 – 3mg/kg

Patient may require positive pressure ventilation if becoming cyanotic or losing consciousness. Can use bag/valve/mask or Laerdal mask with oxygen inlet at 10L/min.

III - CHEST PAIN/MYOCARDIAL INFARCT

Even though chest pain can be from other than cardiac causes, when this occurs in a dental office it should be considered of cardiac cause until proven otherwise in a hospital emergency room.

Activate Emergency Medical Services (EMS)
Oxygen is the first drug to be administered by face mask at 5 – 10L/min
Give one ASA with sips of water, and ***consider*** nitroglycerin (only if systolic BP 90mm Hg or more and no Viagra within 24 hours, or Cialis within 4-5 days).

Repeat nitroglycerin spray under the tongue every 5 minutes two more times if pain continues and while waiting for the ambulance.

If patient loses consciousness assess carotid pulse.

If patient pulseless, start chest compressions and follow Basic Life Support (BLS) protocol.
Provide positive pressure ventilation with bag/valve/mask or Laerdal mask with oxygen inlet at 10L/min.

If Advanced Cardiac Life Support (ACLS) trained, follow ACLS protocol.

IV - GRAND MAL SEIZURES/STATUS EPILEPTICUS/ LOCAL ANESTHETIC OVERDOSE

Most seizures are self-limiting. Remove objects from around patient to prevent injury. It is not necessary to place anything (i.e. tongue blades) in a patient's mouth during a seizure. If a rubber dam or other dental material is in the patient's mouth attempt to retrieve it immediately. Place patient in recovery position (on side with head down) once seizure has terminated, as they often sleep for several minutes. If this is the first time the patient has had a seizure they should be assessed at a hospital emergency room. Call Emergency Medical Services (EMS) for transport.

If the seizure continues 1 – 2 minutes or longer, one should consider the need for treatment:
Activate EMS if haven't already done so.
Administer oxygen 5 – 10L/min. by face mask
Midazolam *(Versed)* 2 – 4mg intramuscular (IM)
If elderly patient, start with 2mg
Children's dosage 0.05mg/kg IM

It may be necessary to monitor/support a patient's airway at this point. A jaw thrust can be done while the oxygen mask is in place. If there are secretions in the patient's mouth evacuate them with suction. If the patient is not breathing then positive pressure ventilation is required with a bag/valve/mask or a Laerdal mask with oxygen inlet at 10L/min.

Staff should post a separate, detailed instruction sheet for Cardiopulmonary Resuscitation, and be competent in CPR

[CPR Basics include: **C-A-B: Circulation (chest compression); Airway, Breathing**, turn patient on back; apply 30 rapid chest compressions to a depth of at least 5cm; lift the angle of mandible to open airway and mouth; assess breathing and pulse; if not breathing administer 2 inflations (ventilations) with proper mask, or pinch nose and breathe in, twice slowly; thereafter, alternate 30 compressions with two breaths until pulse or breathing starts. (The compression to breath ratio is 30:2 for everyone for both one and two rescuers, providing at least 100 compressions per minute; except for infants aged one year or less when it is 15:2 with two rescuers.)]

SPECIFIC SITUATIONS TREATMENT OVERVIEW

TYPE OF MEDICAL EMERGENCY	10-YEAR INCIDENCE *Σ=30,602	COMMON PRESENTATION (INCOMPLETE OVERVIEW; USE WITH OTHER REFERENCES)	TREATMENT(S) (INCOMPLETE OVERVIEW; USE WITH OTHER REFERENCES)	PHONE 911?	CONTINUE DENTAL TREATMENT?
Vasodepressor Syncope (faint)	15,407	Pale, much sweat, slumps, unresponsive.	Recline patient, raise legs, O_2 ± Aromatic Ammonia.	UNLIKELY	NO (WAIT ≥ 24 HRS!)
Mild allergic reaction	2,583	Itching, hives, rash.	Diphenhydramine 25 - 50mg p.o.; RX oral histamine blocker for 3 days. Follow up. If allergy symptoms progress rapidly follow Protocol #I on page 2.	OCCASIONALLY	NO
Angina pectoris	2,552	Cardiac pain of recognized type.	Nitroglycerin, O_2	UNLIKELY	YES, IF SYMPTOMS RESOLVED AND CONSENT GIVEN
Postural hypotension	2,475	Fainting, dizziness, weakness, shock-like symptoms.	Recline while patient recovers, prevent re-occurrence by raising patient slowly.	UNLIKELY	N/A / POSSIBLY
Seizures	1,950		Typically, recline patient; head tilt/chin lift to establish airway. If indicated in patient's medical history, or a first-time seizure, or seizure continues 1 – 2 minutes or longer, one should consider the need for treatment: phone 911; also, if a permissible seizure with spontaneous recovery, permit patient to awake from post-seizure sleep and reassure.	YES, IF AS AT LEFT	NO
Asthma attack (bronchospasm)	1,392	Difficulty breathing, wheezing, sweating, cyanosis.	Position comfortably (upright?) Bronchodilator inhaler ± O_2	YES, IF SEVERE OR NO RESPONSE	YES, IF RESOLVED AND ALL PARTIES CONSENT
Hyperventilation	1,326		~~Breathe into a paper bag until this subsides.~~ instruct to breath from diaphragm	YES, IF NO RESOLUTION	YES, IF SYMPTOMS RESOLVED AND CONSENT GIVEN
"Epinephrine reaction"	913	Tachycardia, anxiety, palpitations.	Strong reassurance, monitor vital signs until recovery - usually in 2 - 3 minutes.	UNLIKELY	YES, IF SYMPTOMS RESOLVED AND CONSENT GIVEN
Insulin shock (hypoglycaemia)	890	In early stages before shock: cold, sweaty, slight tremor, mentally disoriented and unable to respond normally to questions.	Sugar, O_2	UNLIKELY	YES, IF SYMPTOMS RESOLVED AND CONSENT GIVEN
Cardiac arrest	331	Unconscious, unresponsive without signs of life, no pulse, no breathing.	Administer CPR, 100% oxygen, automatic external defibrillation (AED) if available.	YES	NO
Anaphylaxis	304	Severe difficulty breathing, light headedness and others leading to hypotensive shock.	Epinephrine 0.3 – 0.5mg (Deltoid IM, Sublingual or Subcutaneously) IMMEDIATELY, every 5 minutes as required to control symptoms, ± CPR, + O_2, then afterwards, Diphenhydramine 50mg IM or IV.	YES	NO
Myocardial infarct	289	Severe gripping pain or an Atypical presentation.	Get help! Refer to Protocol #III, page 2.	YES	NO
Local anesthetic overdose	204	Rigidity, seizures.	O_2 Airway. Ventilation. Ambulance.	YES	NO
Acute pulmonary edema/Heart failure	141	Shortness of breath (acute), possibly frothy sputum, cyanosis. Upright position.	Stop procedure, O_2 via mask and check vital signs; call for help.	YES	NO
Diabetic coma	109	Slow onset: hours or days; hot, dry; flushed; malaise.	O_2 Airway. Ventilation. Ambulance.	YES	NO
Cerebrovascular accident	68	Dizziness, paraesthesia and/or weakness or paralysis of one side of the body, speech defect, headache, nausea and/or vomiting.	Stop procedure, apply oxygen and check vitals (Blood Pressure, Pulse, and Respiratory Rate), call for help, and support airway as needed.	YES	NO
Adrenal insufficiency	25	Confusion, nausea and vomiting, abdominal pain, hypotension.	Lay patient flat, hydrocortisone IV (200mg), administer O_2	YES	NO
Thyroid storm	4	Hyperthyroid patient and vasoconstrictor used, especially OTHER THAN a very minimal amount of epinephrine.	Get help!	YES	NO

- 10 Year Reported Incidence of Medical Emergencies in Private Dental Clinics, based on the following sources: 1) Malamed, Stanley. "Back to Basics: Emergency Medicine in Dentistry." California Dental Assoc. Journal 25 (4, April 1997): 285-294, a recommended reading that can be ordered through the Canadian Dental Association Resource Centre, at 1-800-267-6354; 2) Fast, TB, "Emergency Preparedness: a survey..." JADA 112 (1986):499-501; and 3) Malamed SF, "Managing Medical Emergencies.." JADA 124 (1993): 40-53.) Other good articles that interested practitioners may wish to include in their 1-800-267-6354 order include: Moore PA. "Review of medical emergencies in dentistry: staff training and prevention. Part 1." Gen Dent.36(1, Jan-Feb 1988):14-7; Moore PA. "Review of medical emergencies in dentistry: diagnosis and management." Gen Dent 36(2, Mar-Apr 1988): 120-3; Burye, M. T., J. P. Gobetti, et al. "A basic approach to management of medical emergencies in the dental office." J Mich Dent Assoc 80(1,1998): 34-43; Wakeen, Linda. "Dental Office Emergencies: Do you know your legal obligations?" JADA 124 (Aug 1993): 54-58. *and for staff,* Malamed, S. F. (1993). "Managing medical emergencies..." J Am Dent Assoc 124(8): 40-53, and R. Duggan Kinne. "Training for Effective Management of Medical Emergencies." Dental Clinics of North America 26 (1, Jan 1982): 147-162.
- *Sheet authored by Drs. Carl Cramer and Reza Nouri of BC Dental Assn. Health Promotions Committee; edited and revised by Dr. Ian Matthew, Head, UBC Dept. of Oral Surgery. February, 2004.*

EMERGENCY DRUGS (AND THEIR APPLICATION)
REQUIRED FOR A DENTAL OFFICE

Oxygen is the most important drug to have available in any emergency setting. A full E-type cylinder is required and must be a dedicated emergency supply and have a regulator/flowmeter/wrench and administration supplies continuously connected. The oxygen cylinder should be checked for pressure regularly and oxygen tubing available for use. Both adult and pediatric face masks are recommended.

All staff should be familiar where the emergency drug kit, oxygen, oxygen tubing and bag/valve/mask or Laerdal mask are stored. Routine overview and checking of expiration dates is required. For patients with a latex allergy care should be taken to ensure that latex free items are available, this includes gloves, tourniquets, bag/valve/mask devices, oropharyngeal airways, etc.

It is important that all staff understand and rehearse their roles in the event of a medical emergency, including the activation of EMS (*Emergency Medical Services*). *TWICE YEARLY EMERGENCY DRILLS ARE RECOMMENDED FOR ALL DENTAL OFFICE STAFF* – refer to the BCDA's *Emergency Preparedness Drill Guidelines for the Dental Office.*

CALL 911 IN ALL EMERGENCIES

Minimum Requirements for Emergency Medications: **CDSBC Minimal and Moderate Sedations in Dentistry "Appendix C"**

DRUG	INDICATIONS	DOSAGE	EXPIRY DATE
OXYGEN	•	• **One Full "E" Cylinder** (See note above)	
EPINEPHRINE OR EPIPENS	• Used for anaphylaxis/allergic reactions and acute asthmatic attack/bronchoconstriction	• **1:1000 in 1ml vial** Two (2) amps of 1:1000 or 1 Epi Pen.	
NITROGLYCERIN SPRAY	• Used for angina attack	• **0.4mg/spray in spray bottle** One (1) spray pump.	
DIPHENHYDRAMINE HC1	• Used for anaphylaxis/allergic reactions	• **50mg in 1ml vial.** Also should have 25mg caplets for adults and 6.25mg/ml liquid for children.	
SALBUTAMOL SULFATE *INHALATIONAL AEROSOL*	• Used for asthmatic attacks/bronchoconstriction	• **Better when administrated with Aerochamber/spacer** One (1) inhaler.	
ASA	• Used for patients who have signs of M.I.	• **One (1) bottle -** Regular 325mg ASA tablet	
FLUMAZENIL	• Only required if benzodiazepines are used	• **One (1) Vial**	
NALOXONE	• Only required if opioids are used	• **Two (2) amps**	
SUPPLEMENTAL GLUCOSE FOR ORAL USE	• Used for hypoglycaemia without coma	• **One (1) source**	

Recommended Additional Supplies:

DRUG	INDICATIONS	DOSAGE	EXPIRY DATE
HYDROCORTISONE SUCCINATE	• Used for anaphylaxis/allergic reactions and acute asthmatic attack/bronchoconstriction	• **100mg in 2ml vial** Recommend one to two vials.	
MIDAZOLAM	• Used for status epilepticus or local anesthetic overdose resulting in seizure	• **Recommend 2-4mg intramuscular (IM).** If elderly patient, start with 2mg. Children's dosage 0.05mg/kg IM.	

RECOMMENDED SUPPLIES *Contact your dental supply company for pre-assembled kits*	
3ml SYRINGES ALCOHOL SWABS AND 22 AND 25 GAUGE LONG NEEDLES ARE RECOMMENDED	Any pharmacy should be able to assist with the recommended medications
STETHOSCOPE & SPHYGMOMANOMETER	
POCKET MASK	With oxygen inlet valve
OROPHARYNGEAL AIRWAYS	Small, medium and large
RUBBER TOURNIQUET	To establish IV administration route
RUBBER GLOVES	For operator protection
YANKAUER THROAT SUCTION	Connect to high volume suction via tubing/connector provided

REMEMBER...

SHAKE and SHOUT

If no response call 911 for help immediately.

C - Chest compressions (push hard push fast)

A - Airway (head tilt - chin lift)

B - Breathing (provide ventilation

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Prepared by Health Promotions Committee – Revised January 2015