Managing Medical Emergencies in a Dental Practice

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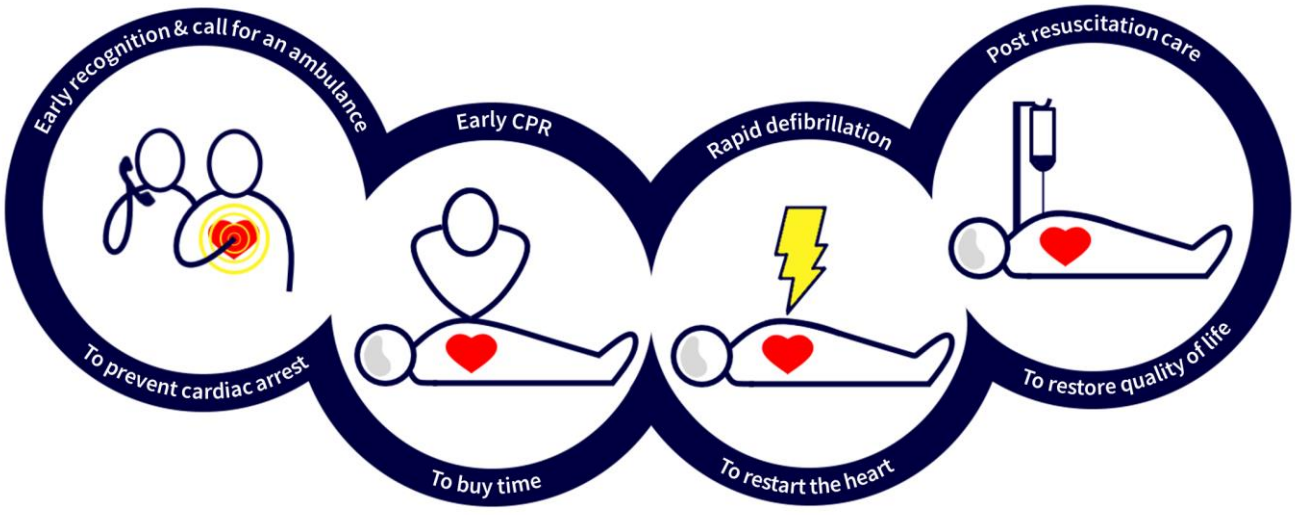

Back to Life Ltd, Milton Heath House, Westcott road, Dorking, Surrey RH4 3NB
Tel: 01372 361206 Web Site: www.backtolife.co.uk e-mail: admin@backtolife.co.uk

The Definition of Anaphylaxis

Anaphylaxis is a severe, life-threatening, generalised or systemic hypersensitivity reaction.

This is characterised by rapidly developing life-threatening airway and/or breathing and/or circulation problems usually associated with skin and mucosal changes.

Anaphylaxis Triggers

Cause	*Example*
Insect venom	Bees, wasps
Food	Nuts, legumes, eggs, fish, shellfish, dairy, fruit,
Drugs	Antibiotics, anaesthetics, NSAIDS, opiates, vaccines
Latex	Gloves, dressings, compression hosiery, condoms, syringes, balloons
other	Contrast media, hair dyes, idiopathic

Diagnosing Anaphylaxis

Anaphylaxis is likely if there are:

- Sudden onset and rapid progression of symptoms
- Life-threatening Airway and/or Breathing and/or Circulation problems
- Skin and/or mucosal changes (flushing, urticaria, angioedema)

The following supports the diagnosis:

- Exposure to a known allergen for the patient

Remember:

- Skin or mucosal changes alone are not a sign of an anaphylactic reaction
- Skin and mucosal changes can be subtle or absent in up to 20% of reactions (some patients can have only a decrease in blood pressure i.e., a Circulation problem)
- There can also be gastrointestinal symptoms (e.g. vomiting, abdominal pain, incontinence)

Assessment – The ABCDE Approach

ABCDE	Use a systematic **ABCDE** approach to assist with the assessment, diagnosis and treatment of someone you suspect may be having an anaphylactic reaction.
Airway	Assess for signs of obstruction, Treat airway obstruction as an emergency, Give high concentrations of oxygen
Breathing	Look, listen and feel for signs of respiratory distress, Count respiratory rates, measure oxygen saturation Give high concentrations of oxygen
Circulation	Assess for signs of shock Measure vital signs/ capillary refill, Lay them flat and raise the legs – where possible, If applicable – cannulation and IV fluid challenge
Disability	Assess the level of consciousness AVPU Assess blood glucose – where possible Consider the recovery position if unconscious
Exposure	Assess for skin and mucosal changes if appropriate Minimise heat loss, Maintain dignity

The Anaphylaxis Algorithm

Guidance for health professionals

Anaphylactic Reaction?

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Airway, Breathing, Circulation, Disability, Exposure

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Diagnosis – Look for:

- Acute onset of illness
- Life-threatening Airway and/or Breathing and/or Circulation problems[1]
- And usually skin changes

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- **Call for help!**
- Lie victim flat
- Raise victim's legs (if breathing is not impaired)

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- **Administer Intramuscular (IM) adrenaline** (if available)[2]

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When skills and equipment available:

- Establish airway
- High flow oxygen
- IV fluid challenge[3]
- Chlorphenamine[4]
- Hydrocortisone[5]

Monitor:

- Pulse oximetry
- ECG
- Blood pressure

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1. Life-threatening problems:
Airway: swelling, hoarseness, stridor
Breathing: rapid breathing, wheeze, fatigue, cyanosis, SpO_2 <92%, confusion
Circulation: pale, clammy, low blood pressure, faintness, drowsy/coma

2. Intramuscular adrenaline:
1:1000 IM adrenaline (repeat after 5 min if no better)

Age	IM Adrenaline
Adult	500 micrograms (0.5mL)
Child > 12 years old	500 micrograms (0.5mL)
Child 6-12 years	300 micrograms (0.3mL)
Child < 6 years old	150 micrograms (0.15mL)

3. IV fluid challenge:
Adult: 500 – 1000 mL
Child: crystalloid 20 mL/kg

Stop IV colloid if this might be the cause of anaphylaxis

Age	4. Chlorphenamine (IM or slow IV)	5. Hydricortisone (IM or slow IV)
Adult or child over 12 years	10 mg	200 mg
Child 6 – 12 years	5 mg	100 mg
Child 6 months – 6 years	2.5 mg	50 mg
Child less than 6 months	250 microgram/kg	25 mg

Source: The Resuscitation Council (UK) - www.resus.org.uk

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Chest Pain

Stable Angina - Normally controlled by medications
Unstable Angina - new onset of severe angina or worsening stable angina
Myocardial Infarction - complete disruption in blood flow through the coronary arteries
Other causes - eg: panic, indigestion, hiatus hernia or musculoskeletal

Signs and Symptoms

- Pain – radiating to neck, jaw, arms
- Clammy/sweaty, shocked
- Tachycardia / irregular pulse
- Blood pressure (Hypo/hypertensive)
- Shortness of breath, cyanosis
- Anxiety
- Collapse

Immediate Management

Stable Angina	**Unstable Angina or Myocardial Infarction**
• Reassurance, rest • GTN (sublingual) 300mcg - 1mg repeat as required (tabs = 300mcg, spray = 400mcg) • May go home if resolves quickly with no reoccurrence	• Call Ambulance • Give high concentration oxygen – non rebreath mask • Give Aspirin 300mg chewed/soluble if not already taken • Give GTN - 2 tablets/puffs sublingual Nitrous oxide 50% and Oxygen 50% can be effective if given continuously where available

Syncope

Inadequate cerebral perfusion (and oxygenation) results in loss of consciousness.

Causes: low blood pressure caused by vagal over activity (a vasovagal attack, simple faint, or syncope). This in turn may follow emotional stress or pain.

Symptoms and signs

- Patient feels faint / dizzy / light headed
- Slow pulse rate
- Low blood pressure
- Pallor and sweating
- Nausea and vomiting
- Loss of consciousness

Immediate management

- Lay the patient flat **as soon as possible** and raise the legs to improve venous return.
- Loosen any tight clothing, especially around the neck and give oxygen (10L/M).
- If any patient becomes unresponsive, always check for 'signs of life' (breathing, circulation) and start CPR in the absence of signs of life or normal breathing
- (ignore occasional 'gasps').

Hypoglycaemia

Dangerously low blood sugar

Causes:

- Diabetic medications
- Have not eaten
- Illness
- Stress
- Poor self management

Signs and Symptoms:

- Loss of concentration or confusion
- Sweaty, clammy
- Hunger
- Unsteady gait
- Aggression
- Rapid heart rate
- Unconsciousness
- Seizures

Immediate Management

Early stages *(where the patient is co-operative and conscious with an intact gag)*	**In more severe cases** *(where the patient has impaired consciousness, is uncooperative or is unable to swallow safely)*
• Give Glucose solutions / tablets 10 - 20g carbohydrate (Approximately 10g of glucose is available from 2 teaspoons sugar) • If necessary this may be repeated in 10–15 minutes	• Call Ambulance • Give Glucagon IM 1mg (should be effective with in 10 minutes) • If not effective in 10 minutes intravenous glucose should be given (by ambulance crew)

All treatments must be followed up with complex carbohydrate

Notes

Asthma

A chronic inflammatory condition causing bronchoconstriction, mucous production and oedema.

Asthma Triggers:

- Pollen / dust
- Animals
- Chemicals/irritants
- Infection
- Cold Air
- Exercise / Stress

Signs and Symptoms of Asthma

Mild to Moderate Asthma	Severe to Life-threatening Asthma
• Chest tightness ,wheeze, cough • Respiration <25 breaths/min • Able to complete sentences • Pulse <110 b/m	• Silent chest • Unable to complete sentences • Cyanosis, hypoxia • Bradycardia, dysrhythmia • Hypotension • Exhaustion, confusion • Coma

Immediate Management of Asthma

Mild to Moderate Asthma	Severe to Life-threatening Asthma
• Manage with their own inhaler if possible - 2 to 4 puffs, repeat if necessary • May go home if resolves	• Call Ambulance • Give high concentration oxygen – preferably via a non rebreath mask • Give Salbutamol • 1 puff via large volume spacer repeat 10 – 20 times • Record P, R , BP if possible

Notes

Epilepsy

Altered neuro-chemical state with excess electrical activity in the brain

Causes:

- Metabolic – ie. Liver or renal
- Structural – head injury
- Infectious - meningitis encephalitis

Signs and Symptoms:

- May be a brief warning or 'aura'
- Sudden loss of consciousness, the patient becomes rigid, falls, may give a cry, becomes cyanosed (tonic phase)
- After a few seconds, there are jerking movements of the limbs; the tongue may be bitten (clonic phase)
- May be frothing from the mouth and urinary incontinence.
- Seizure typically lasts a few minutes; the patient may then become floppy but remain unconscious
- After a variable time the patient regains consciousness but may remain confused

Immediate Management:

Seizure lasting less than a couple of minutes	**If Status Epilepticus (prolonged Tonic - Clonic seizure) or continual fitting for more than 5 minutes**

• Maintain safety – try to prevent injuries
• Note the time
• Do not attempt to restrain the convulsive movements. Allow the seizure to take its course.
• Do not put anything in the person's mouth. There is no danger of swallowing the tongue and teeth can easily be broken.
• Monitor
• Recovery position
	• Call Ambulance
	• If Patient carries own medication – administer it
	  ○ Diazepam
	  ○ Midazolam
	• **Give** high flow oxygen via non re-breath mask

Notes

Drugs for Managing Medical Emergencies in a Dental Practice

Where ever possible use the patient's own medication if they carry it.

INDICATION	DRUG	DOSE & ROUTE
ANAPHYLAXIS	ADRENALINE 1:1000 ampoules With appropriate needle and syringes. Or Prefilled syringes	**ADULTS** 500mcg (0.5ml) IM **PAEDIATRICS** >12years : 500mcg (0.5ml) IM 6 - 12 years : 300mcg (0.3ml) IM Less than 6 years : 150mcg (0.15ml) IM
	Or Adrenaline Auto injectors Follow the administration directions on the device	Epipen 0.3mg – Over 6 years and Adults 0.15 mg – under 6 years Jext 0.3mg – Over 6 years and Adults 0.15 mg – under 6 years Emerade – 0.5mg Over 12 years and adults 0.3mg – 6 – 12 years 0.15mg Less than 6 years
ANGINA / MYOCARDIAL INFARCTION	GLYCERYL TRINITRATE (GTN)	0. 3 – 1 mg sublingually repeated as required (tablets = 300mcg, 500mcg or 600mcg) (spray = 400mcg)
	ASPIRIN	300mg dispersible tablet orally
STATUS EPILEPTICUS	MIDAZOLAM (via the BUCCAL route) Ampoules or Epistatus or Buccolam	**ADULT & CHILD OVER 10 YEARS** 10 mg repeated once after 10 mins if necessary **PAEDIATRICS** 5–10 years, 7.5 mg 1–5 years, 5 mg, or 3mnths – 1 year 2.5mg
ASTHMA	SALBUTAMOL Given via large volume spacer	2 – 10 inhaled puffs of metered dose 100mcg given separately, repeat at 10 – 20 min intervals or if available give nebulized salbutamol
HYPO GLYCAEMIA	(conscious) GLUCOSE TABLETS/DRINK GEL	10 – 20 g orally (e.g. 2 tsp sugar) Glucogel 25g tube administered orally
	(unconscious) GLUCAGON	**ADULTS & CHILD OVER 25 Kg** 1 mg SC or IM **CHILD UNDER 25 Kg** 0.5mg SC or IM

DRUG BOX EQUIPMENT
1 ml/ 2ml syringes
Green 21g , blue 23g orange 25g needles
Swabs, Gloves, sharps box

Additional EQUIPMENT
Blood Glucose monitor
Pulse Oximeter
Sphygmomanometer
Thermometer
Large Volume Spacer

RESUSCITATION EQUIPMENT ORGANISED FOR EASE OF USE
Portable Oxygen with multi flow rate including 15 LPM Must have 30 minutes of oxygen
High flow oxygen masks / oxygen tubing
Oropharyngeal airway (selection of sizes)
Pocket Masks
Adult and Paediatric Bag Valve Mask with oxygen reservoir
Portable Suction equipment
Automated External Defibrillator with 2 sets of electrodes, tuff cut scissors, surgical razor. and Accessories

Resuscitation Council guidance on recommended Resuscitation equipment in a dental practice can be found at https://www.resus.org.uk/library/quality-standards-cpr/primary-dental-care-equipment-list

Recommended drugs can be found in the BNF (paper copy or log in required)

https://bnf.nice.org.uk/treatment-summary/medical-emergencies-in-the-community.html