Emergency Drug Treatment of Selected Medical Conditions (Iraqi Medicines Guide 2016)

Emergency condition	Drug treatment
Anaphylactic shock	Adrenaline injection (1:1000) 0.3-0.5ml I.M Hydrocortisone injection 200 mg I.M Diphenhydramine injection 25-50 mg I.V or I.M
Hypoglycaemia	If the patient is conscious, oral glucose or fruit juice is given. If hypoglycaemia is severe (patient is unconscious), 50ml of 50% dextrose is injected intravenously.
Adrenal crisis	Hydrocortisone injection 200 mg I.M, Intravenous normal saline with 5% glucose. Correct fluid and electrolyte imbalance.
Acute attack of angina/myocardial infarction (Ml)	Nitroglycerin tablet 0.5 mg sublingually. If the pain is relieved, spit out the tablet. If the pain is not relieved, the tablet can be repeated after 5 min, but not more than three tablets in 15 min. If pain is not relieved, it could be Ml. Give tablet aspirin 325 mg orally, oxygen by face mask, then refer the patient to cardiologist.
Status asthmaticus (acute severe asthma)	Humidified oxygen by mask. Salbutamol 5-10 mg + ipratropium bromide 0.5 mg continuous nebulization. Hydrocortisone injection 200 mg I.V stat and 100 mg 6 hourly till the attack subsides. Amoxicillin capsule 500 mg orally three time daily.
Acute bronchial asthma	Salbutamol metered dose inhaler 100 pg /puff: 1- 2 puffs stat and as and when required (not more than 8 puffs/day).
Seizures (epileptic/ drug induced)	Diazepam injection 5-10 mg I.V, slowly; repeat the dose, if necessary.
Tetany	Inject 10-20ml of 10% calcium gluconate slow intravenously.
Hypertensive crisis	Sodium nitroprusside injection 0.25-1.5 pg /kg/minute I.V infusion in 5% dextrose
Thyrotoxic crisis	Propylthiouracil tablet 150-300 mg orally every 6 hours, Ipodate sodium 0.5 g orally daily, Propranolol injection 0.5-2 mg I.V slowly every 4 hours, Hydrocortisone injection 100 mg I.V every 8 hours.

EMERGENCIES IN DENTAL PRACTICE

A dentist can come across several life threatening emergencies in dental practice although not frequently. Several factors have contributed to an increase In the rate of these emergencies like -

1. A rise in geriatric population and a consequent increase in the number of elderly patients seeking dental therapy.
2. The tendency for longer dental appointments.
3. An increase in the use of drugs in dentistry.

Dentists therefore, must be equipped with adequate knowledge for appropriate management of such situations, because they can be life threatening. Treatment and prevention of some of the common emergencies that may be encountered in dental practice are discussed below.

1-Anaphylaxis:

Anaphylaxis: is an immediate type of hypersensitivity reaction and can occur following the use of drugs and allergens. Anaphylaxis is more common following parenteral administration, of drugs. Though it can be induced by any or all drugs, some drugs 1ike lignocaine, penicillin cephalosporin and sulfonamides are more likely to induce anaphylaxis. Antigen - antibody complexes bind to the mast cells leading to the degranulation of these mast cells. This results in the release of massive amounts of histamine and other inflammatory mediators which are responsible for the symptoms of anaphylaxis. Symptoms usually occur within minutes of exposure to the offending agent. Signs and symptoms include:-

- Cutaneous - itching at the site of injection and/or generalized itching, swelling of subcutaneous tissues, eyelids, lips and tongue.
- Respiratory-wheezing due to bronchospasm, cough and laryngeal oedema.
- Cardiovascular - hypotension resulting in dizziness and in more severe cases loss of consciousness.

When severe, it can be rapidly fatal. Hence, every medical and dental practitioner must know to manage anaphylaxis.

Treatment - should be immediate.

- Intramuscular injection of adrenaline 0.5ml of 1:1000 solution is life saving .

The dose may be repeated every 10 minutes if required. If hypotension is not significant, adrenaline may be injected subcutaneously. if anaphylaxis is very severe, 0.5 ml adrenaline may even be given intravenously slowly. Dose may be repeated if needed after 5 to 10 minutes.

- The patient should be put in reclining position.
- Arrangement should be made to transfer the patient to the nearest

emergency ward.

- High flow oxygen should be given.
- Vital signs should be carefully monitored.
- Cardiopulmonary resuscitation may be done if required.
- Intravenous hydrocortisone hemisuccinate 100-200 mg will be needed in severe cases particularly in asthmatics.
- An antihistamine like chlorpheniramine 20 mg IM or diphenhydramine 50 mg IM may be given as an adjuvant. Antihistamines should be continued orally for 2 to 3 days.
- Intravenous fluids should be started. Vasopressors like dopamine may be given if needed.

2-Uncontrolled Bleeding:

Most dental procedures cause some bleeding. It is mostly minor and local application of mild pressure for 10-20 seconds would generally arrest bleeding. If bleeding continues, a cotton swab dipped in 1% adrenaline solution may be used as a pack. Ice pack for a few minutes may also be tried. Gel foam, may be used in more severe bleeding.

Uncontrolled bleeding following dental procedures may be seen in one of the following:-

1. Patients on antiplatelet drugs or those with thrombocytopenia due to any cause.
2. Patients on anticoagulant therapy.
3. Haemophiliacs.
4. Vitamin C deficiency.
5. Long-term glucocorticoid therapy

They should be controlled as follows:

- Reduction in the platelet count or impaired platelet function due to antiplatelet drugs can result in severe bleeding. Appropriate measures should be taken to correct the above before taking the patient for surgery , or other dental procedures associated with bleeding. If the patient is on drugs that inhibit platelet aggregation, consult the physician 1-2 weeks before an elective surgery and under his guidance such drugs may be withdrawn temporarily. Duration of antiplatelet effects of clinically used drugs like ticlopidine and clopidogrel is around 7 to 10 days. Therefore these drugs should be withdrawn about 7-8 days before the procedure and prothrombin time should be brought down to $1^{1/2}$ to 2 times the control value. The antiplatelet drugs should be restarted after adequate healing has occurred. Even minor bleeding including petichiae and ecchymoses should, be watched for:-
- If thrombocytopenia is due to any other cause, platelet transfusion may be

required before any surgical procedure is undertaken in consultation with a physician.

- ❖ If the patient is on anticoagulants, they may be temporarily withdrawn or the dose reduced in consultation with a physician.
- ❖ Drugs with antiplatelet effects like NSAIDs should be used carefully.
- ❖ Vitamin C deficiency as such may result in bleeding from the gums and may enhance bleeding from dental procedures and also impair wound healing. Local application of adrenaline pack or pressure may be needed Following minor dental procedures. Major dental procedures should be done after the correction of vitamin C deficiency.

- ❖ Glucocorticoid therapy—Patients on long-term glucocorticoid therapy may bleed more and wound healing may be impaired. Wounds are also more susceptible to infections. Adequate local haemostatic measures should be taken.

- ❖ Haemophiliacs—are deficient in coagulation factor VIII and are therefore likely to bleed more even from minor dental procedures. Factor VIII should be supplemented before the dental procedure and adequate local haemostatic measures should be taken.

3. Unconsciousness:

Patients with no response to stimuli need immediate attention.

Unconsciousness in dental practice may be due to one of the following causes:-

- ➢ ***Vasovagal attack/syncope/fainting***

Vasovagal attack is the transient loss of consciousness due to a painful or an emotional_stimulus. Pathophysiology involves an autonomic imbalance. In response to the stimulus, the vagus is stimulated which in turn results in bradycardia, reduced cardiac output and hypotension accompanied by peripheral vasodilation. Hypotension reduces the bloodsupply to the brain leading to cerebral hypoxia which in turn results in unconsciousness. However, the patient recovers in 1-2 minutes because the sympathetic system gets activated and reverses the symptoms.

Treatment:

- ✓ Elevate feet to Increase venous return.
- ✓ Loosen tight clothing to facilitate breathing.
- ✓ Give cold compress to promote peripheral vasoconstriction and increase venous return.
- ✓ Oxygen inhalation may be given.

- ***Hypoglycaemia*** –

Is to be expected in patients with diabetes mellitus. Signs and symptoms include sweating, tachycardia, tremors, blurred vision, weakness, hunger, confusion and drowsiness leading on to unconsciousness. In mild hypoglycaemia, oral administration of sugar or sugar containing fruit juices are sufficient to overcome the symptoms. In unconscious patients, 50 ml of 50% dextrose is given intravenously usually patient recovers within a few minutes.

- ***Seizures –***

- ***Arrhythmias*** **- may be**

✓ Bradyarrhythmias-transient loss of consciousness with slow irregular heart rate of <40 beats/minute.

✓ Tachyarrhythmias-Heart rate >150/ minute may be associated with fatigue, breathlessness and syncope.

- ***Cardiac arrest*** is stoppage of the heart, also called cardiac standstill. If revived on time the heart may recover.

Clinical features –

✓ Loss of consciousness
✓ Absence of pulses.
✓ Gasping or absence of breathing.

Management

❖ Maintain airway - turn the patient's head to a side, use mouth gag.
❖ Raise the foot end.
❖ Mouth to mouth respiration to be given- take 4 quick, deep breaths and then exhale into the patient's mouth. This has to be repeated 12 times per minute.
❖ As an alternative, bag mask may be used with 100% oxygen.
❖ External cardiac massage to be given at 60 chest compressions per minute.
❖ 0.5ml of 1:1000 solution of adrenaline should be injected intravenously or in more severe cases intracardiac adrenaline injection may be needed.

❖ Medical assistance should be taken at the earliest possible.

4. Seizures

Patients can develop symptoms ranging from brief lapses of awareness to generalized convulsions usually lasting for less than 5 minutes.

i) If tonic clonic seizures start during a dental procedure:-

✓ Remove instruments or dentures if any from the oral cavity.
✓ Place a gag or a padded tongue depressor in the mouth between the teeth.
✓ Turn the head to a side this keeps the airway clear and prevents the tongue from falling back.

- ✓ If seizures continue, 10 mg diazepam should be given intravenously.
- ✓ Whenever possible dental procedure may be jpostponed.
- ✓ If the patient continues to have seizures despite treatment, physician should be called and managed as (status epilepticus

ii) Absence seizures—There is sudden impairment of consciousness associated with starring. The patient stops all ongoing activities, but recovers within a few seconds. The episode lasts for a brief period, generally less than 30 seconds.

It only requires reassurance. Patient should be advised to see a physician later.

iii) Atonic seizures—also called drop attacks are characterized by sudden loss of postural tone and the head may drop for a few seconds or the person may drop to the ground for no obvious reasons. The patient recovers usually within a few seconds and only requires reassurance particularly if the patient is already on treatment by a physician.

5. Ischemic Heart Disease

Ischemic heart diseases include angina and myocardial infarction.

Angina pectoris is the principle symptom of ischemic heart disease and is characterized by sudden severe .substernal pain or discomfort which may radiate to the left shoulder or medial aspect of the left arm. It is precipitated by Stress and anxiety, Most dental procedures are painful and may evoke some anxiety. Therefore during a dental procedure, IHD patients may experience an episode of exertional angina or very rarely develop myocardial infarction.

- ➢ IHD patients should be taken up for early appointments in the morning and not made to wait.
- ➢ Patients with known IHD should be asked to carry their rescue medication i.e nitroglycerine tablets for sublingual use to the dental clinic. In patients with moderate to severe angina, prophylactic nitroglycerine (0.5mg tab sublingually) may be used 5 minutes before starting the dental procedure.

- ➢ If a patient gets an acute episode of angina during a dental procedure.
- ✓ Stop the dental procedure for a few minutes.
- ✓ Administer tab nitroglycerine 0.5mg sublingually. It relieves pain in 2-5 minutes.
- ✓ Monitor pulse and BP.
- ✓ If pain is not relieved in 8-10 minutes, nitroglycerine dose may be repeated, (maximum of 3 tablets in 15-20 minuteip Even then, if the pain does not subside,there are chances that the patient may be going into myocardial infarction. Immediate medical attention should be sought.

Myocardial Infraction

Sign and symptoms- severe substernal pain, radiating to the left shoulder, with nausea, vomiting, palpitationand, sweating, patient appears pale and apprehensive. Patient should be shifted to emergency care at the earliest possible. While such arrangements are being done, injection pethidine 50 mg or morphine 10 mg should given intramuscularly, Patient should be made to swallow a tablet of aspirin 300 mg. Oxygen inhalation should be given if possible.

6.Shock

Intravenous fluid are sterile solutions meant for intravenous administration. The content and quantity of solute varies. Intravenous fluids are used for replacement of fluids and electrolytes and nutrition. There are different types of IV fluids to be given depending on the patient's requirements. knowledge of the different IV fluids available is important.
intravenous Fluids .

Types o f i.V Solutions
Intravenous solutions are of 3 types depending on osmolality - *isotonic, hypotonic or hypertonic.* Fluids having an osmolality nearly equal to that of extracellular fluid (ECF) or if the electrolyte content (cations+ anions) is nearly equal to 310mEq/L- they are considered isotonic.

Isotonic electrolyte content = 310mEq/L
hypotonic electrolyte content < 250mEq/L
hypertonic electrolyte content >375mEq/L
(plasma osmolality is nearly equal to 300 m mol/L. osmolality of 10% dextrose is 505 m mol/L

Isotonic fluid: as isotonic fluids have an osmolality nearly equal to that of ECF, they do not alter the size of RBCs (neither shrink nor swell). One litre of isotonic solution expands ECF by 1litre. But it quickly diffuses into the ECF compartment and therefore around 3 litres of isotonic fluid is needed to replenish volume of one litre of lost blood. However patients with, hypertension and cardiac failure need careful monitoring to avoid fluid overload. Isotonic solutions include normal saline and lactated ringer solution.

Normal saline solution - 0.9 % sodium chloride , It is used in hyponatraemia. It should be avoid in heart failure, pulmonary oedema and renal impairment.

Lactated ringer solution contains potassium, calcium and sodium chloride. It is used to correct dehydration, hyponatraemia and to replace gastrointestinal fluids. Many other similar solutions are available with minor changes in the electrolyte content.

Hypotonic fluids Hypotonic fluids replace cellular fluid because they are hypotonic as compared to plasma. Half normal saline (0.45% sodium chloride solution) is the commonly used hypotonic solution ,but other electrolyte solutions are also available. Hypotonic sodium solution is used in hypernatraemia and other hyperosmolar conditions. Overdosage can result in intravascular depletion, hypotension, cellular edema and later cell damage.

Hypertonic fluids Five percent dextrose in normal saline or lactated ringer's solution or in hypotonic solution has osmolality more than ECF 45 to 50%. Dextrose solution may administered in hypoglycaemia or to supplement calories. Since these solutions are strongly hypertonic, they should be injected into central veins for rapid dilution. Hypertonic saline solutions draw water from the cells and the cells shrink. They should be injected slowly and carefully to avoid ECF volume overload.

7. Diabetic Ketoacidosis

May be precipitated by infection, stress or trauma. It is more common m patients with insulin - dependent diabetes mellitus. Diabetic ketoacidosis is a medical emergency and can be life threatening. Insulin deficiency can be life threatening. Insulin deficiency results in sever hyperglycaemia (600-800mg/dl and excessive production of ketone bodies.

Clinical features include metabolic acidosis, dehydration with loss of sodium and
Potassium in the urine causing electrolyte imbalance, impaired consciousness and hyperventation- may proceed to coma.
Diabetic ketoacidosis should be suspected when the patient has IDDM, diabetes is uncontrolled, patient is under stress, or has infection and develops the above signs and symptoms.

Treatment

- Correction of hyperglycaemia

intravenous regular (plane) insulin0.lU/kg bolus followed by 0.1 U/kg/hour by continuous IV infusion till the patient recovers. Once the patient has fully recovered, insulin should be administered subcutaneously 30 minutes before stopping the infusion.

- Correction of dehydration

Fluid and electrolyte replacement are important, Normal saline infusion I litre in the first

hour and then1 litre over the next 4 hours and then the quantity can be titrated based on the severity of dehydration.

- Correction of acidosis

Sodium bicarbonate may be needed in some patients severe acidosis.

- Potassium

Rapid correction of hyperglycaemia may result in the movement of potassium into the cells resulting in hypokalemia. 10-20 mEq/hour potassium chloride is added to the drip. When serum phosphate is also low, potassium biphosphate may be given to supplement both potassium and phosphorus,

Hyperglycemic, hyperosmolar, nonketotic, coma -

Sever hyperglycaemia and glucosuria result in severe dehydration and increase plasma osmolarity leading to coma and has a high mortality rate. The treatment is similar to ketoacidosis with correction of fluid and electrolyte balance and plane insulin.

8. Acute Addisonian Crisis

Acute Addisonian Crisis is an emergency condition that could be precipitated by an infection or sudden withdrawal of steroids after long term administration.Proper drug history is Therefore very important. If the patient has been on glucocorticoids (prednisolone) for more than 2 weeks, itshould be continued. The dentist should make sure that the patient receives his dose of glucocorticoid on the day of dental

procedure particularly if it is a major procedure. Symptoms include nausea,vomiting weakness, hypotension,dehydration, hyponatraemia and hyperkalaemia. Intravenous hydrocortisone hemisuccinate 100 mg bolus followed by infusion 100 mg every 4-6 hours is given immediately. The dose may be repeated depending on the patient's condition. Once the patient recovers, switch over to oral preparations. Immediate correction of fluid and electrolyte balance is important. When acute adrenal insufficiency is not confirmed, dexamethasone (4mg IV) should be used in of hydrocortisone because dexamethasone does not interfere in the estimation of hydrocortisone levels for diagnosis.

9. Tetany

Tetany is due to hypocalcaemia. Other features of hypocalcaemia include muscle cramps, paraesthesias, laryngospasm and in more severe cases-convulsions. Slow intravenous injection of 5020 ml of 10% calcium gluconate relieves tetany. Care should be taken to inject calcium slowly because rapid intravenous injection of calcium can cause cardiac arrhythmias which can be tatal.

10. Status Asthmatics

An acute attack of bronchial asthma may be precipitated by dental procedures themselves, the stress or anxiety due to them or the drugs and materials used in such

procedures. A known asthmatic patient should be told to attend the clinic with bronchodilator inhaler which the patient has been taking - preferably saibutamol. An acute attack should be treated with 1-2 puffs of 100- 200 ㎍g saibutamol.
Acute severe asthma or status asthmatics needs immediate treatment.