

# **CARDIOVASCULAR PROBLEMS**

## ***ISCHEMIC HEART DISEASES***

FAAIZ ALHAMDANI, PHD

# ANGINA PECTORIS



# ANGINA PECTORIS


- (THE TERM *ANGINA* IS DERIVED FROM THE ANCIENT GREEK WORD MEANING “A CHOKING SENSATION.”)
- THIS CONDITION OCCURS PRIMARILY IN MEN OLDER THAN AGE 40 YEARS AND IS ALSO PREVALENT IN POSTMENOPAUSAL WOMEN
- THE PAIN CAN RADIATE TO THE LEFT SHOULDER AND ARM AND **EVEN INTO THE MANDIBULAR REGION.**
- STIMULATION OF VAGAL ACTIVITY COMMONLY OCCURS WITH RESULTING NAUSEA, SWEATING, AND BRADYCARDIA.

# DENTAL MANAGEMENT

- PREVENTIVE MEASURES
- THESE BEGIN WITH TAKING A CAREFUL HISTORY OF THE PATIENT'S ANGINA. (THE PATIENT SHOULD BE QUESTIONED) ABOUT:
  - 1- THE EVENTS THAT TEND TO PRECIPITATE THE ANGINA; THE FREQUENCY,
  - 2- DURATION, AND SEVERITY OF ANGINA; AND THE RESPONSE TO MEDICATIONS OR DIMINISHED ACTIVITY.
  - 3- THE PATIENT'S PHYSICIAN CAN BE CONSULTED ABOUT THE PATIENT'S CARDIAC STATUS.



# WHEN TO POSTPONE ELECTIVE SURGERY

- IF ANGINAL EPISODES OCCUR WITH ONLY MINIMAL EXERTION,
  - IF SEVERAL DOSES OF NITROGLYCERIN ARE NEEDED TO RELIEVE CHEST DISCOMFORT,
  - OR IF THE PATIENT HAS UNSTABLE ANGINA (I.E., ANGINA PRESENT AT REST
  - OR WORSENING IN FREQUENCY, SEVERITY, EASE OF PRECIPITATION, DURATION OF ATTACK, OR PREDICTABILITY OF RESPONSE TO MEDICATION),
- 

# GENERAL ANXIETY-REDUCTION PROTOCOL

## Before Appointment

- Hypnotic agent to promote sleep on night before surgery (optional)
- Sedative agent to decrease anxiety on morning of surgery (optional)
- Morning appointment and schedule so that reception room time is minimized

## During Appointment

### Nonpharmacologic Means of Anxiety Control

- Frequent verbal reassurances
- Distracting conversation
- No surprises (clinician warns patient before doing anything that could cause anxiety)
- No unnecessary noise
- Surgical instruments out of patient's sight
- Relaxing background music

# GENERAL ANXIETY-REDUCTION PROTOCOL

## Pharmacologic Means of Anxiety Control

- Local anesthetics of sufficient intensity and duration
- Nitrous oxide
- Intravenous anxiolytics

## After Surgery

- Succinct instructions for postoperative care
- Patient information on expected postsurgical sequelae (e.g., swelling or minor oozing of blood)
- Further reassurance
- Effective analgesics
- Patient information on who can be contacted if any problems arise
- Telephone call to patient at home during evening after surgery to check whether any problems exist

# SUMMARY

- SOME CLINICIANS ALSO ADVISE GIVING NO MORE THAN 4 ML OF A LOCAL ANESTHETIC SOLUTION WITH A 1 : 100,000 CONCENTRATION OF EPINEPHRINE FOR A TOTAL ADULT DOSE OF 0.04 MG IN ANY 30-MINUTE PERIOD.

1. Consult the patient's physician.
2. Use an anxiety-reduction protocol.
3. Have nitroglycerin tablets or spray readily available. Use nitroglycerin premedication, if indicated.
4. Ensure profound local anesthesia before starting surgery.
5. Consider the use of nitrous oxide sedation.
6. Monitor vital signs closely.
7. Consider possible limitation of amount of epinephrine used (0.04 mg maximum).
8. Maintain verbal contact with patient throughout the procedure to monitor status.



# MYOCARDIAL INFARCTION



A collaboration between the American Association of Colleges of Nursing and Khan Academy

These videos do not provide medical advice and are for informational purposes only.  
The videos are not intended to be a substitute for professional medical advice, diagnosis, or treatment.

[www.khanacademy.org](http://www.khanacademy.org)



# MYOCARDIAL INFARCTION

- THE INFARCTED AREA OF MYOCARDIUM BECOMES NONFUNCTIONAL AND EVENTUALLY NECROTIC AND IS SURROUNDED BY AN AREA OF USUALLY REVERSIBLY ISCHEMIC MYOCARDIUM THAT IS PRONE TO SERVE AS A NIDUS FOR DYSRHYTHMIAS.
- DURING THE EARLY HOURS AND WEEKS AFTER AN MI, IF THROMBOLYTIC TREATMENT WAS TRIED BUT WAS UNSUCCESSFUL, TREATMENT WOULD CONSIST OF LIMITING MYOCARDIAL WORK REQUIREMENTS, INCREASING MYOCARDIAL OXYGEN SUPPLY, AND SUPPRESSING THE PRODUCTION OF DYSRHYTHMIAS BY IRRITABLE FOCI IN ISCHEMIC TISSUE OR BY SURGICAL BYPASS OF THE BLOCKED VESSELS TO PROMOTE REVASCULARIZATION. IN ADDITION, IF ANY OF THE PRIMARY CONDUCTION PATHWAYS WERE INVOLVED IN THE INFARCTED AREA, PACEMAKER INSERTION MAY BE NECESSARY.
- IF THE PATIENT SURVIVED THE EARLY WEEKS AFTER AN MI, THE VARIABLY SIZED NECROTIC AREA WOULD BE GRADUALLY REPLACED WITH SCAR TISSUE, WHICH IS UNABLE TO CONTRACT OR PROPERLY CONDUCT ELECTRICAL SIGNALS.

# DENTAL MANAGEMENT

- THE MANAGEMENT OF AN ORAL SURGICAL PROBLEM IN A PATIENT WHO HAS HAD AN MI BEGINS WITH A CONSULTATION WITH THE PATIENT'S PHYSICIAN.
- IN GENERAL, IT IS RECOMMENDED THAT **ELECTIVE MAJOR SURGICAL PROCEDURES BE DEFERRED UNTIL AT LEAST 6 MONTHS AFTER AN INFARCTION.** THIS DELAY IS BASED ON STATISTICAL EVIDENCE THAT THE RISK OF REINFARCTION AFTER AN MI DROPS TO AS LOW AS IT WILL EVER BE BY ABOUT 6 MONTHS, PARTICULARLY IF THE PATIENT IS PROPERLY SUPERVISED MEDICALLY.
- THE ADVENT OF THROMBOLYTIC-BASED TREATMENT STRATEGIES AND IMPROVED MI CARE MAKE AN AUTOMATIC 6-MONTH WAIT TO DO DENTAL WORK UNNECESSARY. **STRAIGHTFORWARD ORAL SURGICAL PROCEDURES TYPICALLY PERFORMED IN THE DENTAL OFFICE MAY BE PERFORMED LESS THAN 6 MONTHS AFTER AN MI IF THE PROCEDURE IS UNLIKELY TO PROVOKE SIGNIFICANT ANXIETY AND THE PATIENT HAD AN UNEVENTFUL RECOVERY FROM THE MI.**
- IF MORE THAN 6 MONTHS HAVE ELAPSED OR PHYSICIAN CLEARANCE IS OBTAINED, THE MANAGEMENT OF THE PATIENT WHO HAS HAD AN MI IS SIMILAR TO CARE OF THE PATIENT WITH ANGINA. **AN ANXIETY-REDUCTION PROGRAM SHOULD BE USED.**
- **PROPHYLACTIC NITROGLYCERIN SHOULD BE ADMINISTERED ONLY IF DIRECTED BY THE PATIENT'S PRIMARY CARE PHYSICIAN, BUT NITROGLYCERIN SHOULD BE READILY AVAILABLE.** LOCAL ANESTHETICS CONTAINING EPINEPHRINE ARE SAFE TO USE IF GIVEN IN PROPER AMOUNTS USING AN ASPIRATION TECHNIQUE. VITAL SIGNS SHOULD BE MONITORED THROUGHOUT THE PERIOPERATIVE PERIOD

# SUMMARY

1. Consult the patient's primary care physician.
2. Check with the physician if invasive dental care is needed before 6 months since the myocardial infarction.
3. Check whether the patient is using anticoagulants (including aspirin).
4. Use an anxiety-reduction protocol.
5. Have nitroglycerin available; use it prophylactically if the physician advises.
6. Administer supplemental oxygen (optional).
7. Provide profound local anesthesia.
8. Consider nitrous oxide administration.
9. Monitor vital signs, and maintain verbal contact with the patient.
10. Consider possible limitation of epinephrine use to 0.04 mg.
11. Consider referral to an oral-maxillofacial surgeon.

# CARDIAC DYSRHYTHMIAS


- CARDIAC DYSRHYTHMIAS MANIFEST AS UNCOORDINATED CONTRACTIONS OF THE CHAMBERS OF THE HEART
- **ATRIAL FIBRILLATION** IS THE MOST COMMON DYSRHYTHMIA TO OCCUR IN PATIENTS OLDER THAN 50 YEARS. BECAUSE PATIENTS WHO ARE PRONE TO OR WHO HAVE CARDIAC DYSRHYTHMIAS MAY HAVE A HISTORY OF ISCHEMIC HEART DISEASE
- THESE PATIENTS MAY HAVE BEEN PRESCRIBED **ANTICOAGULANTS** OR MAY HAVE A PERMANENT **CARDIAC PACEMAKER**.
- IN PATIENTS WITH PACEMAKERS. ELECTRICAL EQUIPMENT, SUCH AS ELECTROCAUTERY AND MICROWAVES, SHOULD NOT BE USED NEAR THE PATIENT.
- NO EVIDENCE EXISTS THAT SHOWS THE NEED FOR ANTIBIOTIC PROPHYLAXIS IN PATIENTS WITH PACEMAKERS
- MANY ADVOCATE LIMITING THE **TOTAL AMOUNT OF EPINEPHRINE ADMINISTRATION TO 0.04 MG.**

# CEREBROVASCULAR ACCIDENT

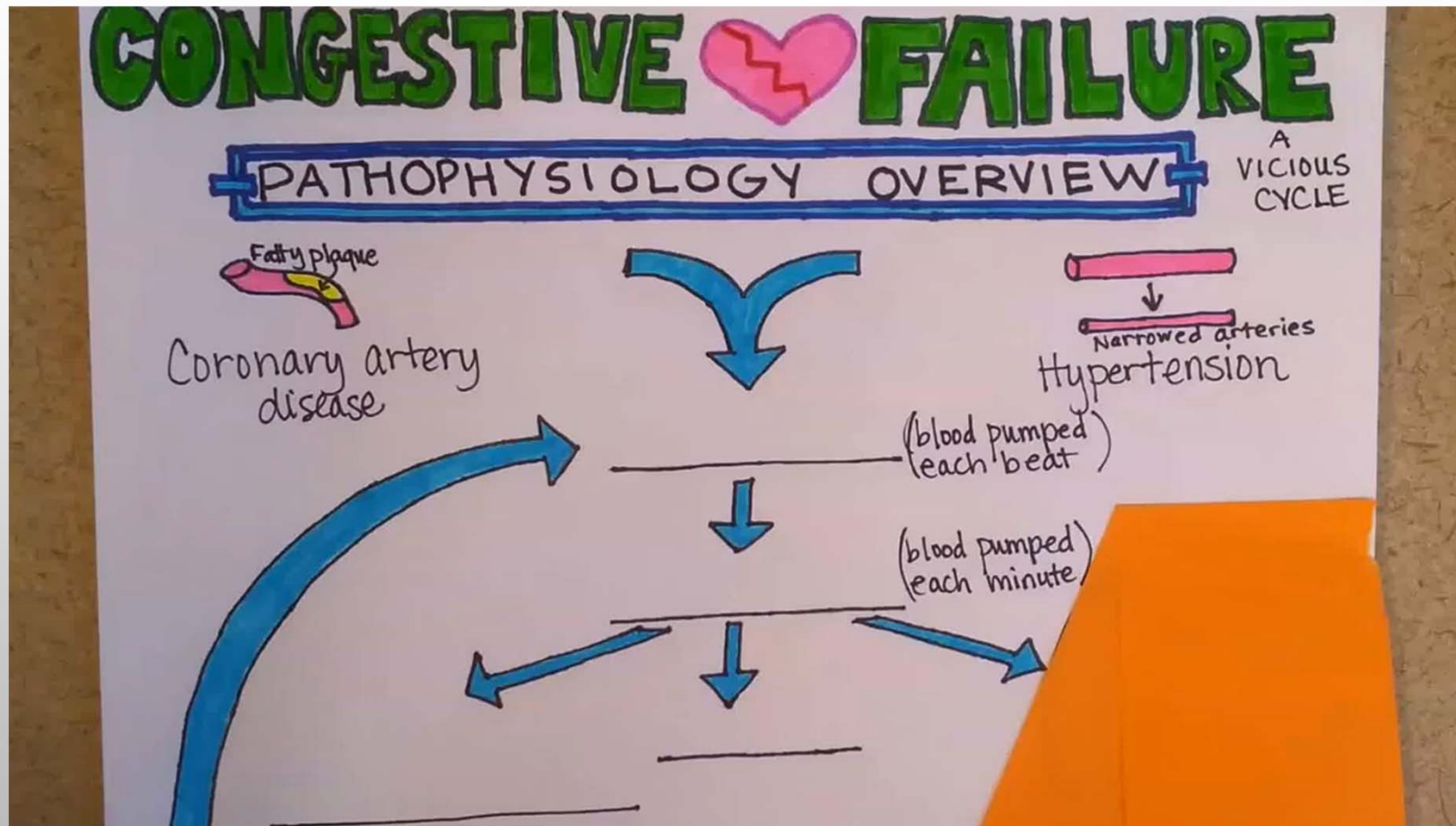
- PATIENTS WHO HAVE HAD A CEREBROVASCULAR ACCIDENT (CVA) ARE ALWAYS SUSCEPTIBLE TO FURTHER NEUROVASCULAR ACCIDENTS. SUCH PATIENTS ARE GIVEN **ANTICOAGULANTS** OR **ANTIPLATELET** MEDICATION; IF THEY ARE HYPERTENSIVE, THEY ARE GIVEN ANTIHYPERTENSIVE MEDICATIONS).
- IF SUCH A PATIENT REQUIRES SURGERY, CLEARANCE BY THE PATIENT'S PHYSICIAN IS DESIRABLE, AS IS A DELAY **UNTIL SIGNIFICANT HYPERTENSIVE TENDENCIES HAVE BEEN CONTROLLED**. THE PATIENT'S BASELINE
- NEUROLOGIC STATUS SHOULD BE ASSESSED AND DOCUMENTED PREOPERATIVELY.
- THE PATIENT SHOULD BE TREATED BY A **NONPHARMACOLOGIC ANXIETY REDUCTION PROTOCOL**
- IF PHARMACOLOGIC SEDATION IS NECESSARY, **LOW CONCENTRATIONS OF NITROUS OXIDE** CAN BE USED.



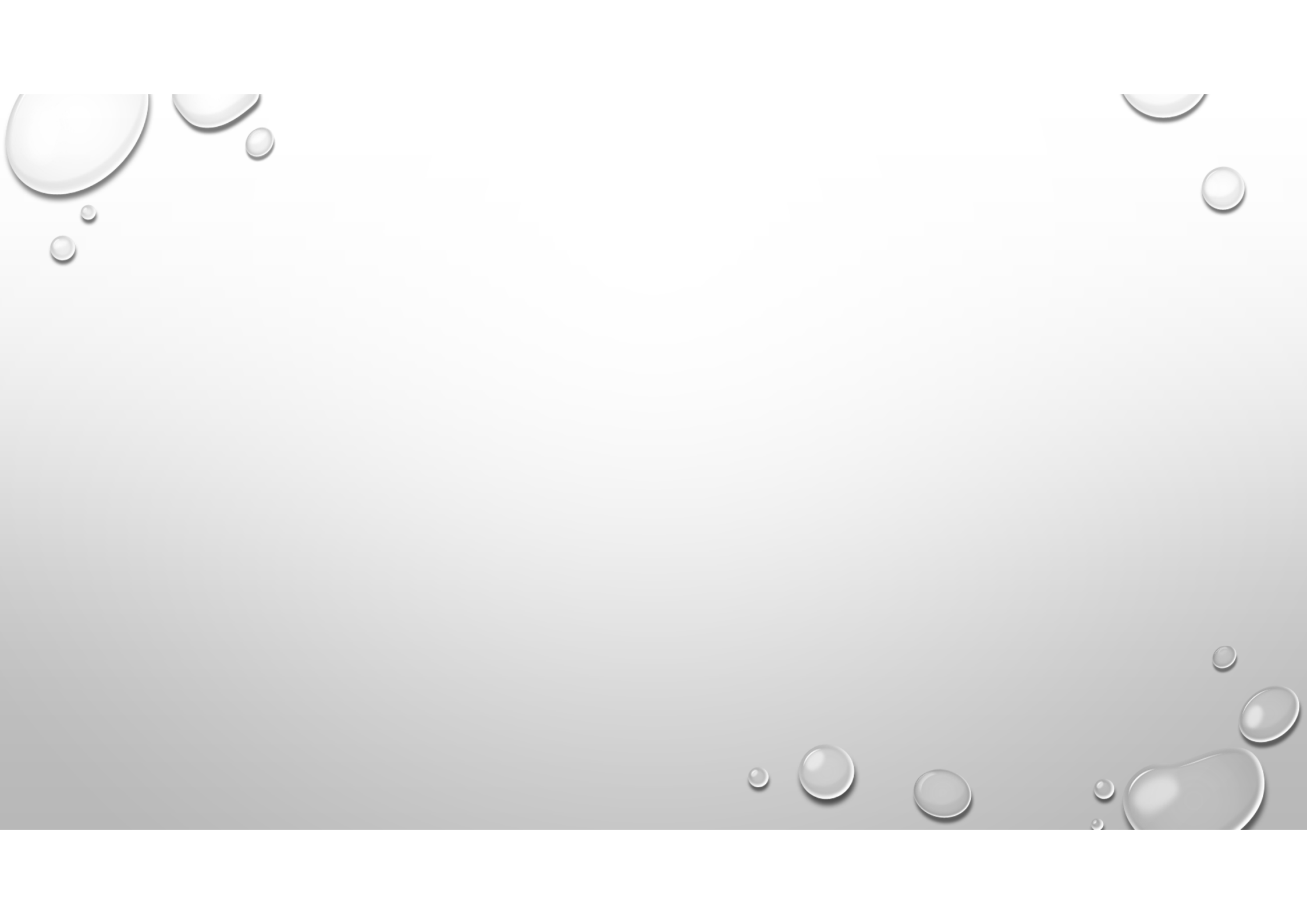
## **CONGESTIVE HEART FAILURE (HYPERTROPHIC CARDIOMYOPATHY)**

- CHF (HCM) OCCURS WHEN A DISEASED MYOCARDIUM IS UNABLE TO DELIVER THE CARDIAC OUTPUT DEMANDED BY THE BODY OR WHEN EXCESSIVE DEMANDS ARE PLACED ON A NORMAL MYOCARDIUM
  - THIS RESULTS IN BLOOD BACK FLOW INTO THE PULMONARY, HEPATIC, AND MESENTERIC VASCULAR BEDS. THIS EVENTUALLY LEADS TO PULMONARY EDEMA, HEPATIC DYSFUNCTION, AND COMPROMISED INTESTINAL NUTRIENT ABSORPTION.
  - SYMPTOMS OF CHF INCLUDE ORTHOPNEA, PAROXYSMAL NOCTURNAL DYSPNEA, AND ANKLE EDEMA. ORTHOPNEA IS A RESPIRATORY DISORDER THAT EXHIBITS SHORTNESS OF BREATH WHEN THE PATIENT IS SUPINE.
- 

# CONGESTIVE HEART FAILURE (HYPERTROPHIC CARDIOMYOPATHY)







## **CONGESTIVE HEART FAILURE (HYPERTROPHIC CARDIOMYOPATHY)**

### **• BOX 1.12 Management of the Patient With Congestive Heart Failure (Hypertrophic Cardiomyopathy)**

1. Defer treatment until heart function has been medically improved and the patient's physician believes treatment is possible.
2. Use an anxiety-reduction protocol.
3. Consider possible administration of supplemental oxygen.
4. Avoid using the supine position.
5. Consider referral to an oral-maxillofacial surgeon.

# REVIEW OF CARDIOVASCULAR SYSTEM

- **BOX 1.5** Review of Cardiovascular and Respiratory Systems

## Cardiovascular Review

Chest discomfort on exertion, when eating, or at rest; palpitations; fainting; ankle edema; shortness of breath (dyspnea) on exertion; dyspnea on assuming supine position (orthopnea or paroxysmal nocturnal dyspnea); postural hypotension; fatigue; leg muscle cramping

# PULMONARY PROBLEMS

- **ASTHMA:** TRUE ASTHMA INVOLVES THE **EPISODIC NARROWING OF INFLAMED SMALL AIRWAYS**, WHICH PRODUCES WHEEZING AND DYSPNEA AS A RESULT OF CHEMICAL, INFECTIOUS, IMMUNOLOGIC, OR **EMOTIONAL STIMULATION** OR A COMBINATION OF THESE.
- PATIENTS WITH SEVERE ASTHMA REQUIRE XANTHINE-DERIVED BRONCHODILATORS, SUCH AS **THEOPHYLLINE**, AS WELL AS **INHALED CORTICOSTEROIDS** OR **SHORT COURSES OF HIGH-DOSE SYSTEMIC CORTICOSTEROIDS**
- THE PATIENT'S OWN INHALER SHOULD BE AVAILABLE DURING SURGERY, AND DRUGS SUCH AS **INJECTABLE EPINEPHRINE, THEOPHYLLINE, AND INHALED BETA AGONISTS SHOULD BE KEPT IN AN EMERGENCY KIT**

• **BOX 1.14** Management of Patient With Chronic Obstructive Pulmonary Disease

1. Defer treatment until lung function has improved and treatment is possible.
2. Listen to the chest bilaterally with stethoscope to determine adequacy of breath sounds.
3. Use an anxiety-reduction protocol, but avoid the use of respiratory depressants.
4. If the patient requires chronic oxygen supplementation, continue at the prescribed flow rate. If the patient does not require supplemental oxygen therapy, consult his or her physician before administering oxygen.
5. If the patient chronically receives corticosteroid therapy, manage the patient for adrenal insufficiency.
6. Avoid placing the patient in the supine position until you are confident that the patient can tolerate it.
7. Keep a bronchodilator-containing inhaler accessible.
8. Closely monitor respiratory rate and heart rate.
9. Schedule afternoon appointments to allow for clearance of secretions.

# **RENAL FAILURE**

- PATIENTS WITH CHRONIC RENAL FAILURE REQUIRE PERIODIC RENAL DIALYSIS. THESE PATIENTS NEED SPECIAL CONSIDERATION DURING ORAL SURGICAL CARE.
- CHRONIC DIALYSIS TREATMENT TYPICALLY REQUIRES THE PRESENCE OF AN ARTERIOVENOUS SHUNT, WHICH IS A LARGE, SURGICALLY CREATED JUNCTION BETWEEN AN ARTERY AND A VEIN. THE SHUNT ALLOWS EASY VASCULAR ACCESS AND HEPARIN ADMINISTRATION, PERMITTING BLOOD TO MOVE THROUGH THE DIALYSIS EQUIPMENT WITHOUT CLOTTING.
- **THE DENTIST SHOULD NEVER USE THE SHUNT FOR VENOUS ACCESS EXCEPT IN A LIFE-THREATENING EMERGENCY. THE BLOOD PRESSURE CUFF SHOULD NEVER BE USED ON THE ARM WHERE AN ARTERIOVENOUS SHUNT IS PRESENT.**

# RENAL FAILURE

- **ELECTIVE ORAL SURGERY IS BEST UNDERTAKEN THE DAY AFTER A DIALYSIS** TREATMENT HAS BEEN PERFORMED. THIS ALLOWS THE HEPARIN USED DURING DIALYSIS TO DISAPPEAR AND THE PATIENT TO BE IN THE BEST PHYSIOLOGIC STATUS WITH RESPECT TO INTRAVASCULAR VOLUME AND METABOLIC BYPRODUCTS.
- RELATIVELY NEPHROTOXIC DRUGS SUCH AS **NSAIDS SHOULD** ALSO BE **AVOIDED** IN PATIENTS WITH SERIOUSLY COMPROMISED KIDNEYS.
- BECAUSE OF THE HIGHER INCIDENCE OF **HEPATITIS** IN PATIENTS UNDERGOING RENAL DIALYSIS, DENTISTS SHOULD TAKE THE NECESSARY PRECAUTIONS.
- THE **ALTERED APPEARANCE OF BONE** CAUSED BY **SECONDARY HYPERPARATHYROIDISM** (INCREASED OSTEOCLASTIC ACTIVITY) IN PATIENTS WITH RENAL FAILURE SHOULD ALSO BE NOTED.

# RENAL TRANSPLANTATION AND TRANSPLANTATION OF OTHER ORGANS

- THESE PATIENTS RECEIVE CORTICOSTEROIDS AND MAY NEED SUPPLEMENTAL **CORTICOSTEROIDS** IN THE PERIOPERATIVE PERIOD
- THE PATIENT'S PRIMARY CARE PHYSICIAN SHOULD BE CONSULTED ABOUT THE NEED FOR **PROPHYLACTIC ANTIBIOTICS**.
- **CYCLOSPORINE A**, AN IMMUNOSUPPRESSIVE DRUG ADMINISTERED AFTER ORGAN TRANSPLANTATION, MAY CAUSE **GINGIVAL HYPERPLASIA**.
- PATIENTS WHO HAVE RECEIVED RENAL TRANSPLANTS OCCASIONALLY HAVE PROBLEMS WITH **SEVERE HYPERTENSION**



## • **BOX 1.16** Management of Patient With Renal Transplant

1. Defer treatment until the patient's primary care physician or transplant surgeon clears the patient for dental care.
2. Avoid the use of nephrotoxic drugs.<sup>a</sup>
3. Consider the use of supplemental corticosteroids.
4. Monitor blood pressure.
5. Consider screening for hepatitis B virus before dental care. Take necessary precautions if unable to screen for hepatitis.
6. Watch for presence of cyclosporine-A–induced gingival hyperplasia. Emphasize the importance of oral hygiene.
7. Consider use of prophylactic antibiotics, particularly in patients taking immunosuppressive agents.

<sup>a</sup>*In patients with other transplanted organs, the clinician should avoid the use of drugs toxic to that organ.*

*Most of these recommendations also apply to patients with other transplanted organs.*

# **HYPERTENSION**

- CHRONICALLY ELEVATED BLOOD PRESSURE FOR WHICH THE CAUSE IS UNKNOWN IS CALLED **ESSENTIAL HYPERTENSION**. MILD OR MODERATE HYPERTENSION (I.E., **SYSTOLIC PRESSURE <200 MM HG OR DIASTOLIC PRESSURE <110 MM HG**) IS USUALLY NOT A PROBLEM IN THE PERFORMANCE OF AMBULATORY ORAL SURGICAL CARE, AS LONG AS THE PATIENT IS NOT HAVING SIGNS OR SYMPTOMS OF **END-ORGAN INVOLVEMENT** SECONDARY TO THE ELEVATED BLOOD PRESSURE.
- CARE OF THE POORLY CONTROLLED HYPERTENSIVE PATIENT INCLUDES USE OF AN ANXIETY-REDUCTION PROTOCOL AND MONITORING OF VITAL SIGNS.
- **EPINEPHRINE-CONTAINING LOCAL ANESTHETICS SHOULD BE USED CAUTIOUSLY;**

# ENDOCRINE DISORDERS

## *DIABETES MELLITUS*

- DIABETES MELLITUS IS CAUSED BY AN **UNDERPRODUCTION OF INSULIN**, A RESISTANCE OF **INSULIN RECEPTORS IN END ORGANS** TO THE EFFECTS OF INSULIN, OR BOTH.
- DIABETES IS COMMONLY DIVIDED INTO INSULIN-DEPENDENT (TYPE 1) AND NON-INSULIN-DEPENDENT (TYPE 2) DIABETES.
- **TYPE 1 DIABETES** USUALLY BEGINS DURING **CHILDHOOD OR ADOLESCENCE**. THE MAJOR PROBLEM IN THIS FORM OF DIABETES IS AN UNDERPRODUCTION OF INSULIN, WHICH RESULTS IN THE INABILITY OF THE PATIENT TO USE GLUCOSE PROPERLY.
- THE SERUM GLUCOSE RISES ABOVE THE LEVEL AT WHICH RENAL REABSORPTION OF ALL GLUCOSE CAN TAKE PLACE, CAUSING GLYCOSURIA. THE OSMOTIC EFFECT OF THE GLUCOSE SOLUTE RESULTS IN POLYURIA, STIMULATING THIRST AND CAUSING POLYDIPSIA (FREQUENT CONSUMPTION OF LIQUIDS) IN THE PATIENT. IN ADDITION, CARBOHYDRATE METABOLISM IS ALTERED



A collaboration between the American Association of Colleges of Nursing and Khan Academy

These videos do not provide medical advice and are for informational purposes only.  
The videos are not intended to be a substitute for professional medical advice, diagnosis, or treatment.

[www.khanacademy.org](http://www.khanacademy.org)

