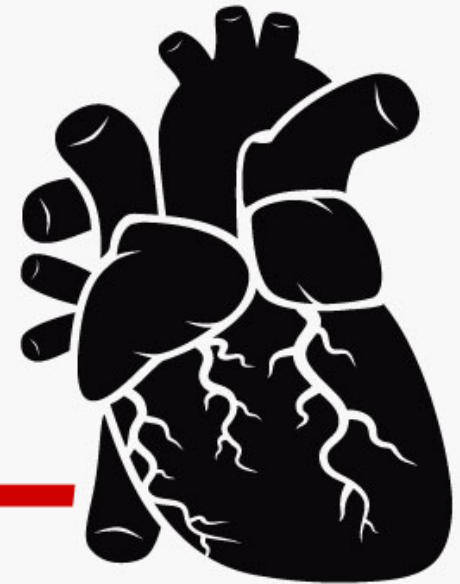
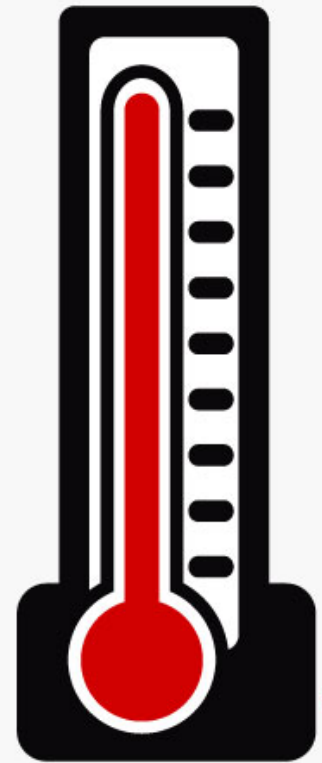


HYPERTENSION



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Definition

- Hypertension is an abnormal elevation in arterial pressure that can be fatal if sustained and untreated.
- People with hypertension **may not display clinical signs or symptoms** for many years but eventually can experience symptomatic damage to several target organs, including kidneys, heart, brain, and eyes
- In adults, a sustained **systolic** blood pressure of **140** mm Hg or greater and/or a sustained **diastolic** blood pressure of **90** mm Hg or greater is defined as hypertension

Classification according to Joint National Committee (JNC 7)

TABLE 3-1 Classification of Blood Pressure (BP) in Adults and Recommendations for Follow-up

BP Classification	Systolic BP (mm Hg)		Diastolic BP (mm Hg)	Recommended Follow-up
Normal	<120	<i>and</i>	<80	Recheck in 2 years
Prehypertension	120-139	<i>or</i>	80-89	Recheck in 1 year
Stage 1 hypertension	140-159	<i>or</i>	90-99	Confirm within 2 months
Stage 2 hypertension	≥160	<i>or</i>	≥100	Evaluate or refer to source of care within 1 month. For those with higher pressures (e.g., >180/110 mm Hg), evaluate and treat immediately or within 1 week, depending on the clinical situation and complications

Etiology

- About 90% of patients have no readily identifiable cause for their disease, which is referred to as **primary (essential) hypertension**.
- In the remaining 10% of patients, an underlying cause or condition may be identified; **secondary hypertension**
- Lifestyle can play an important role in the severity and progression of hypertension;
 - obesity,
 - excessive alcohol intake,
 - excessive dietary sodium, and
 - physical inactivity

Etiology

BOX 3-1

Identifiable Causes of Hypertension

- Sleep apnea
- Drug-induced or drug-related
- Chronic kidney disease
- Primary aldosteronism
- Renovascular disease
- Chronic steroid therapy and Cushing syndrome
- Pheochromocytoma
- Coarctation of the aorta
- Thyroid or parathyroid disease

Pathophysiology and Complications

- Blood pressure = cardiac output x peripheral resistance
- In primary hypertension, the basic underlying defect is a failure in the regulation of vascular resistance.
- The pulsating force is modified by the **degree of elasticity** of the walls of larger arteries and the **resistance** of the arteriolar bed.

Pathophysiology and Complications

- **Mechanisms of control** is multifactorial include
 - neural reflexes
 - Ongoing maintenance of sympathetic vasomotor tone
 - effects mediated by neurotransmitters such as norepinephrine,
 - extracellular fluid, and sodium stores
 - renin-angiotensin-aldosterone pressor system;
 - Locally active hormones and substances such as prostaglandins, kinins, adenosine, and hydrogen ions (H⁺).
- In **isolated systolic hypertension** (seen in elderly)
 - central arterial stiffness and loss of elasticity

Pathophysiology and Complications

- Many **physiologic factors** may have an effect on blood pressure.
 - **Increased viscosity of the blood** (e.g. polycythemia) may cause an elevation in blood pressure resulting from an increase in resistance to flow.
 - A **decrease in blood volume or tissue fluid volume** (e.g., anemia, hemorrhage) reduces blood pressure.
 -
 - An **increase in blood volume or tissue fluid volume** (e.g., sodium/fluid retention) increases blood pressure.
 - **Increases in cardiac output** associated with exercise, fever, or thyrotoxicosis also may increase blood pressure.

Pathophysiology and Complications

- Blood pressures above 115 mm Hg systolic and 75 mm Hg diastolic are associated with increased risk of cardiovascular disease
- For every increase in blood pressure of 20 mm Hg systolic and 10 mm Hg diastolic, a doubling of mortality related to ischemic heart disease and stroke occurs.
- Hypertension precedes the onset of vascular changes in the kidney, heart, brain, and retina that lead to such clinical complications as renal failure, stroke, coronary insufficiency, MI, congestive heart failure, dementia, encephalopathy, and blindness.

Signs and Symptoms of Hypertensive Disease

Early

- Elevated blood pressure readings
- Narrowing and sclerosis of retinal arterioles
- Headache
- Dizziness
- Tinnitus

Advanced

- Rupture and hemorrhage of retinal arterioles
- Papilledema
- Left ventricular hypertrophy
- Proteinuria
- Congestive heart failure
- Angina pectoris
- Renal failure
- Dementia
- Encephalopathy

MEDICAL MANAGEMENT

- prehypertension are not usually candidates for drug therapy but rather are encouraged to adopt lifestyle modifications to decrease their risk of developing the disease

BOX 3-3

Lifestyle Modifications for Prevention and Reduction of High Blood Pressure

- Weight loss
- DASH (Dietary Approaches to Stop Hypertension) diet
 - Fruits
 - Vegetables
 - Low-fat dairy products
- Reduced intake of cholesterol-rich foods
- Reduced intake of saturated and total fats
- Reduced sodium intake to less than 2.4 g/day
- Regular aerobic physical activity on most days (30 minutes of brisk walking)
- Limited alcohol intake to no more than 1 oz/day (2 drinks for men and 1 drink for women)

MEDICAL MANAGEMENT

- all people with hypertension— stages 1 and 2—should be treated
- Those **most commonly** used include
 - thiazide diuretics (Lasix)
 - angiotensin-converting enzyme inhibitors (ACEIs) (Capoten)
 - angiotensin receptor blockers (ARBs) (Diovan)
 - Beta blockers (BBs) (Tenormin)
 - calcium channel blockers (CCBs)(Amlodipine)
- Other drugs that are **less frequently** used include
 - α 1- adrenergic blockers
 - central α 2 agonists, as well as other centrally acting drugs
 - direct vasodilators.

DENTAL MANAGEMENT

- **Medical Considerations**
- Thorough medical history including diagnosis of HT, treatment of HT, response to treatment as well as the treatment of complications associated with HT
- Blood pressure measurements should be routinely performed for all new patients and at recall appointments.
- primary concern in dental management of a patient with hypertension is that during the course of treatment, a sudden, acute elevation in blood pressure might occur, potentially leading to a serious outcome such as **stroke or MI**
- This is due to adrenaline which either
 - Endogenous : stress and anxiety
 - Exogenous : LA

DENTAL MANAGEMENT

- American College of Cardiology and the American Heart Association have published practice guidelines for the perioperative evaluation of patients with cardiovascular disease
- These guidelines provide a framework to estimate the risk for occurrence of a stroke, MI, acute heart failure, or sudden death as a result of the surgery.

DENTAL MANAGEMENT

the determination of risk includes the evaluation of three factors:

(1) the risk imposed by the patient's cardiovascular disease

(2) the risk imposed by the surgery or procedure

(3) the risk imposed by the functional reserve or capacity of the patient.

DENTAL MANAGEMENT

(1) the risk imposed by the patient's cardiovascular disease

Major Risk Factors

- Unstable coronary syndromes
 - Acute or recent myocardial infarction† with evidence of important ischemic risk in clinical signs and symptoms or noninvasive study
 - Unstable or severe angina (Canadian class III or IV)
- Decompensated heart failure
- Significant arrhythmias
- Severe valvular disease

Intermediate Risk Factors

- History of ischemic heart disease
- History of compensated or previous heart failure
- History of cerebrovascular disease
- Diabetes mellitus
- Renal insufficiency

Minor Risk Factors

- Advanced age (>70 years)
- Abnormal ECG (left ventricular hypertrophy, left bundle branch block, ST-T abnormalities)
- Rhythm other than sinus rhythm
- Uncontrolled systemic hypertension (blood pressure $\geq 180/110$ mm Hg)

DENTAL MANAGEMENT

(2) the risk imposed by the surgery or procedure

High (Reported Cardiac Risk Often Greater Than 5%)

- Aortic and other major vascular surgery
- Peripheral vascular surgery

Intermediate (Reported Cardiac Risk Generally Less Than 5%)

- Intraperitoneal and intrathoracic surgery
- Carotid endarterectomy
- Head and neck surgery
- Orthopedic surgery
- Prostate surgery

Low (Reported Cardiac Risk Generally Less Than 1%)

- Endoscopic procedures
- Superficial procedures
- Cataract surgery
- Breast surgery
- Ambulatory surgery

DENTAL MANAGEMENT

- The third factor involved in risk assessment is determination of the ability of the patient to perform certain physical activities (*functional capacity*) and is defined in metabolic equivalents (METs)
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- Perioperative cardiac risk is increased in patients who are unable to meet a 4-MET demand during most normal daily activities
- Thus, a patient who reports inability to climb a flight of stairs without chest pain, shortness of breath, or fatigue would be at increased risk during a procedure

DENTAL MANAGEMENT

TABLE 3-5 Dental Management and Follow-up Recommendations Based on Blood Pressure

Blood Pressure (mm Hg)	Dental Treatment Recommendation	Follow-up Recommendation
$\leq 120/80$	Any required	No physician referral necessary
$\geq 120/80$ <i>but</i> $< 140/90$	Any required	Encourage patient to see physician
$\geq 140/90$ <i>but</i> $< 160/100$	Any required	Encourage patient to see physician
$\geq 160/100$ <i>but</i> $< 180/110$	Any required; consider intraoperative monitoring of blood pressure for upper-level stage 2 hypertension	Refer patient to physician promptly (within 1 month)
$\geq 180/110$	Defer elective treatment	Refer to physician as soon as possible; if patient is symptomatic, refer immediately

DENTAL MANAGEMENT

- Patients with uncontrolled blood pressure esp. when associated with symptoms such as headache, shortness of breath, or chest pain should be referred to a physician for immediate evaluation.
- In patients with uncontrolled hypertension, certain problems such as pain, infection, or bleeding may necessitate urgent dental treatment.
- In such instances, the patient should be managed in consultation with the physician, and measures such as intraoperative blood pressure monitoring, electrocardiogram monitoring, establishment of an intravenous line, and sedation may be used
- benefit of treatment outweighs the potential risks.

How you deal with hypertensive patient safely

- 1- make every effort to reduce as much as possible the stress and anxiety associated with dental treatment
- Long or stressful appointments are best avoided. Short morning appointments seem best tolerated
- If the patient becomes anxious or apprehensive during the visit, the appointment may be terminated and rescheduled for another day.
- Anxiety can be reduced for many patients by oral premedication with a short-acting benzodiazepine such as triazolam taken 1 hour before treatment
- Nitrous oxide plus oxygen for inhalation sedation is an excellent intraoperative anxiolytic for use in patients with hypertension.

How you deal with hypertensive patient safely

- 2- Blood pressure
- For patients with stage II hypertension, periodic monitoring of pressure during treatment may be advisable. If the blood pressure rises above 179/109 mm Hg, the procedure should be terminated, the patient referred to his or her physician, and the appointment rescheduled.
- For patients with a pressure reading >180/110 mm Hg, dental treatment should be **deferred** until blood pressure is brought under control. **If urgent or emergency** dental treatment is required, it should be done in as limited and conservative a manner as possible.

How you deal with hypertensive patient safely

- 3- Chair position
 - Avoid rapid position changes owing to possibility of antihypertensive drug-associated orthostatic hypotension
- 4- the use of vasoconstrictors
- Modest doses of local anesthetic with 1 : 100,000 or 1 : 200,000 epinephrine (e.g., 1 or 2 carpules) at a given time are of little clinical consequence in patients with blood pressure <180/110 mm Hg.
 - Greater quantities may be tolerated reasonably well, but with increased risk.
 - Levonordefrin should be avoided.

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How you deal with hypertensive patient safely

- 4- the use of vasoconstrictors
- In patients with uncontrolled hypertension (blood pressure >180/110 mm Hg), the use of epinephrine may be tolerated but should be discussed with the physician
- avoid using gingival retraction cord that contains epinephrine, because this material contains highly concentrated epinephrine, which can be quickly absorbed through abraded gingival sulcus tissues, resulting in tachycardia and elevated blood pressure.

How you deal with hypertensive patient safely

5- Antibiotics

- Avoid the use of erythromycin and clarithromycin (not azithromycin) with calcium channel blockers, because the combination can enhance hypotension.

6- Analgesics

- Avoid long-term (>2 weeks) use of NSAIDs, because these agents may interfere with effectiveness of some antihypertensive medications.



thank
you