



## A Review On Hypertension

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### ABSTRACT:

We described hypertension as systolic blood strain  $\geq 130$  mmHg, diastolic  $\geq 80$  mmHg, or antihypertensive remedy use. Epidemiological research have related continual publicity to arsenic (As) from ingesting water with improved hazard of hypertension. As an Inter-American Society we are satisfied of the want to standardize the steps in which we diagnose, evaluate, deal with and manipulate hypertension, setting up suggestions and regulations that must be adopted in all countries of Latin America, aimed at standardizing administration and manipulate of CV hazard in order to reap a substantial limit in CV events. Modern therapy of pulmonary hypertension has decreased morbidity and mortality related with this condition and has additionally expanded the high-quality of lifestyles of female with pulmonary hypertension .Pregnancy in ladies with pulmonary hypertension continues to existing special challenges The existing study showed, age as one of the widespread hazard elements for incidence of hypertension. hypertension used to be greater in alcohol-intake, tobacco-smoking/chewing participants and sedentary lifestyles fashion is additionally one of tremendous threat element for hypertension. Machine getting to know (ML) is a department of synthetic brain that combines pc science, statistics, and choice idea to learn complicated patterns from voluminous data. In the final decade, gathering proof has proven the utility of ML for prediction, diagnosis, and classification of hypertension and coronary heart failure (HF).To have a look at the modifications in prevalence, awareness, cure and manage of hypertension between 1998 and 2016 in  $\geq 15$ -year-old South African guys and girls and the sociodemographic traits related with those changes. Hypertension onset age, midnight blood strain ranges and a riser pattern are relevant for the prognosis of future cardiovascular diseases. The chance of coronary heart sickness appears to expand linearly with growing workout systolic blood pressure. Renin angiotensin system blockers are now not related with an improved danger for a extreme path of COVID-19. In elderly patients, a risk-benefit evaluation of intensified blood stress manipulate need to be individually evaluated.

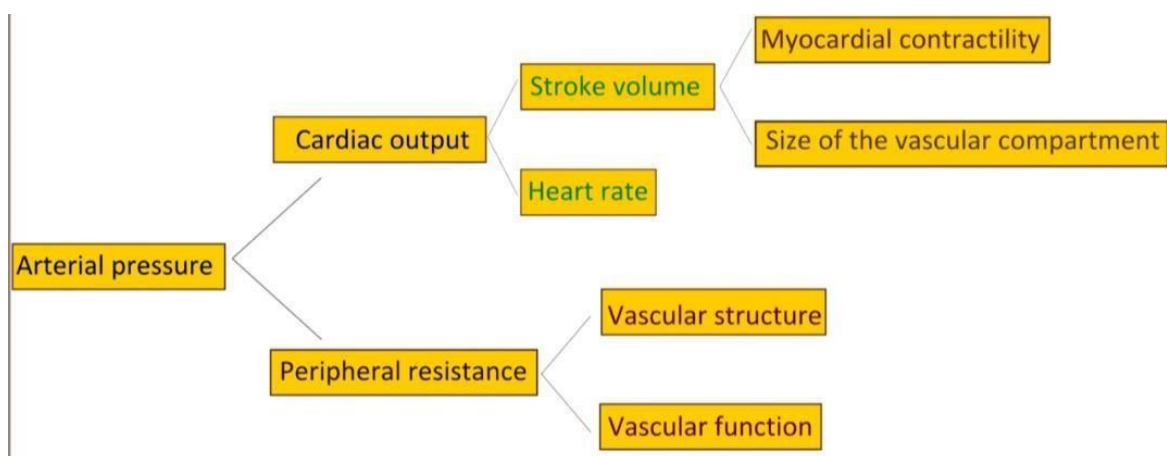
### Introduction

Hypertension, a frequent shape of cardiovascular sickness (CVD), is a leading chance issue in world disorder burden, hence, an vital public health hassle in the world It has been said that while the incidence of hypertension is lowering in high-income countries, it is nevertheless growing in low and middle-income nations in India, hypertension incidence has improved over the closing three a long time , rising as the most vital hazard thing for deaths and disability-adjusted lifestyles years Epidemiological research have proven that persistent publicity to arsenic (As) from consuming water is associated to multiplied chance of CVD AS contaminated areas of India [2] APOs share more than one threat factors with cardiovascular disease, such as obesity, older age, social determinants of health, and continual infection APOs may unmask an underlying maternal phenotype with greater threat of cardiovascular ailment these disorders, specifically preeclampsia, may cause endothelial dysfunction with vascular effects that persist long after the being pregnant , resulting in earlier development of chronic hypertension and other vascular chance factors. Onset of hypertension earlier in life is associated with higher threat of heart failure, stroke, and cognitive decline . Consequently, development of hypertension subsequent to pregnancy may play an essential role on the pathway linking APOs to increased risk of future cardiovascular and cerebrovascular disease.[1] In the final 4 years 5 vital hints on hypertension have been published: The Guidelines on the administration of arterial hyper-tension and associated comorbidities in Latin America [3] Current practices are reviewed related to region of care, anesthetic management, pulmonary vasodilators , inotropic therapy, required monitoring and get right of entry to and mechanical guide .Pulmonary hypertension in being pregnant consists of a mortality price ranging from three to 43% relying on etiology and severity of pulmonary hypertensions.[4] Hypertension is one of the main public fitness issues around the globe and its occurrence is swiftly growing amongst developing countries.1 It's essential to observe that enlarge in hypertension directly make contributions on even extra serious prerequisites like strokes,Diabetes, coronary heart ailments and renal impairment.2 Therefore administration of hypertension has emerge as a largest venture in developing united states like India. Hypertension, generally acknowledged as excessive blood strain defined with general standards as systolic BP a hundred and forty mmHg and diastolic BP ninety mmHg. [5]The China hypertension survey suggests that approximately 1.3% of adults (estimated 13.7 million) have HF Among HF sufferers with hypertension, solely 57.7% receive antihypertensive therapy, and solely 14.5%have their blood strain below manipulate Improvement in screening, prevention, and administration of hypertension is quintessential to minimize the burden of hypertension and related HF .Machine getting to know (ML) is a department of synthetic talent that combines laptop science, statistics, and choice concept to analyze complicated patterns from voluminous facts (12–14). The medical dreams of ML consist of prediction, diagnosis, classification, automatic photograph assessment, amongst others (12,15–17). In the closing 5 years, greater than 3,000 papers about ML in cardiovascular care have been published, with most research centered on the areas of atherosclerosis, hypertension, and HF . Considering the excessive burden of hypertension and HF in China and worldwide, ML may additionally assist tackle these challenges from specific factors [6]The burden of raised blood strain (BP) i.e. systolic BP  $\geq 140$  mmHg and/or diastolic BP  $\geq 90$  mmHg and hypertension, which consists of individuals on

antihypertensive medication, is developing global and the number of adults with raised BP has extended from an estimated 594 million in 1975 to 1.13 billion in 2015. Although the numbers with raised BP have risen worldwide, the prevalence of raised BP between 1975 and 2015 declined in HICs and in some middle-income be counted [7]. Hypertension stays the most common chance thing for cardiovascular illnesses (CVD). The research mentioned herein deal with the association between age of hypertension onset and future CVD, the reliability of office, home, and ambulatory BP, the prognostic cost of dead night BP, new insights into exercise-induced hypertension and administration of hypertension in high-risk affected person groups, as sufferers 80 years and sufferers with atrial fibrillation (AF) requiring oral anticoagulation [8].

## Pathophysiology

Pathophysiology is a department of remedy which explains the characteristic of the physique as it relates to ailments and conditions. The pathophysiology of hypertension is an region which tries to provide an explanation for mechanistically the motives of hypertension, which is a continual sickness characterized via elevation of blood pressure. [10]

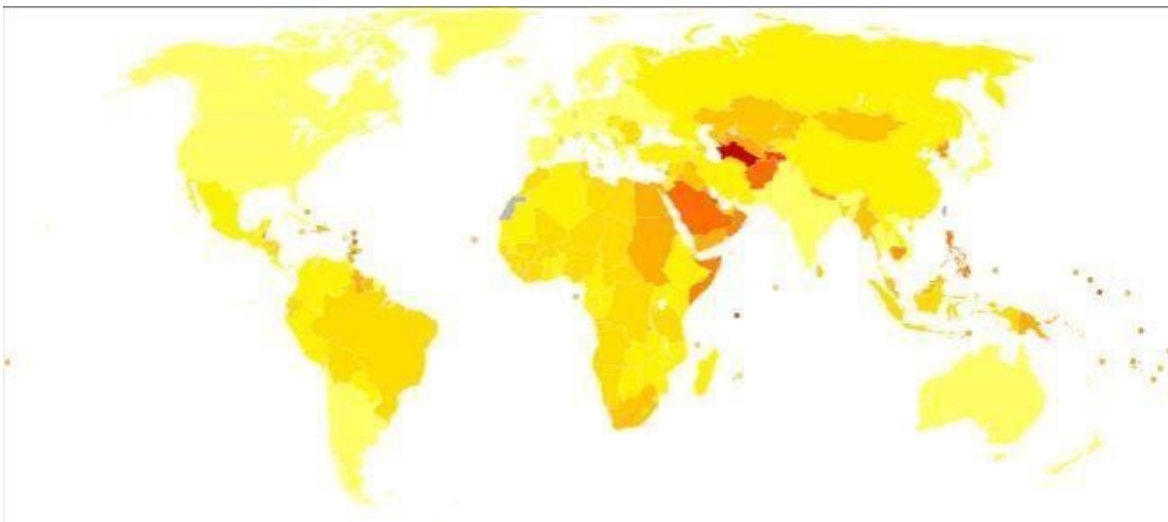


Hypertension can be labeled by way of reason as both necessary (also acknowledged as foremost or idiopathic) or secondary. About 90–95% of hypertension is crucial hypertension. Some authorities outline integral hypertension as that which has no recognized explanation, whilst others outline its purpose as being due to overconsumption of sodium and under consumption of potassium. Secondary hypertension suggests that the hypertension is an end result of a particular underlying situation with a regular mechanism, such as continual kidney disease, narrowing of the aorta or kidney arteries, or endocrine problems such as extra aldosterone, cortisol, or catecholamine's. Persistent hypertension is a principal danger issue for hypertensive coronary heart disease, coronary artery disease, stroke, aortic aneurysm, peripheral artery disease, and continual kidney disease. Cardiac output and peripheral resistance are the two determinants of arterial pressure. [6] Cardiac output is decided by way of stroke extent and coronary heart rate; stroke extent is associated to myocardial contractility and to the measurement of the vascular compartment. Peripheral resistance is decided by means of purposeful and anatomic adjustments in small arteries and arteriovenous [11].

## Epidemiology



Rates of hypertension in adult men in 2014.



Disability adjusted life year for hypertensive heart disease per 100,000 Inhabitants in 2004

#### Adults

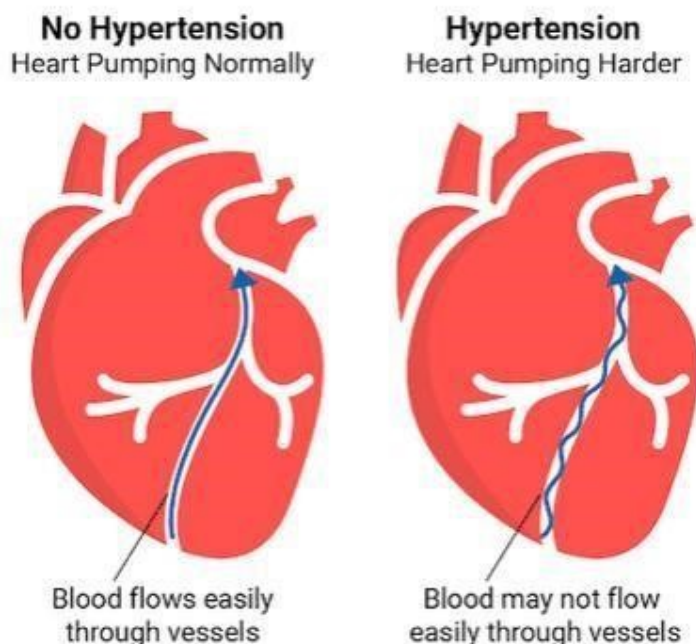
As of 2014, about one billion adults or ~22% of the populace of the world have hypertension. It is barely extra popular in men, in these of low socioeconomic status, and it turns into extra frequent witage. It is frequent in high, medium, and low profits countries. IN 2004 prices of excessive blood stress have been perfect in Africa, (30% for each sexes) and lowest in the Americas (18% for each sexes). Rates additionally fluctuate markedly inside areas with fees as low as 3.4% (men) and 6.8% (women) in rural India and as excessive as 68.9% (men) and 72.5% (women) in Poland. Rates in Africa have been about 45% in 2016. [12]

#### Childrens

Edit rates of excessive blood stress in teens and teens have improved in the ultimate 20 years in the United States.[15] Childhood hypertension, mainly in pre-adolescents, is greater regularly secondary to an underlying ailment than in adults. Kidney disorder is the most frequent secondary reason of hypertension in youth and adolescents. Nevertheless, essential or fundamental hypertension bills for most instances [13]

#### Types of hypertension

There are two major hypertension types. For ninety five percentage of human beings with excessive blood pressure, the motive of their hypertension is unknown — this is known as essential, or primary, hypertension. When a reason can be found, the situation is referred to as secondary hypertension. [14]



#### **Essential hypertension.**

This kind of hypertension is diagnosed after a doctor notices that your blood pressure is high on three or greater visits and eliminates all other causes of hypertension. Usually people with essential hypertension have no symptoms, however you may experience frequent headaches, tiredness, dizziness, or nose bleeds. Although the motive is unknown, researchers do know that obesity, smoking, alcohol, diet, and heredity all play a role in essential hypertension. [9]

#### **Secondary hypertension.**

The most frequent reason of secondary hypertension is an abnormality in the arteries offering blood to the kidneys. Other reasons encompass airway obstruction for the duration of sleep, ailments and tumors of the adrenal glands, hormone abnormalities, thyroid disease, and too an awful lot salt or alcohol in the diet. Drugs can motive secondary hypertension, along with over-the-counter medicinal drugs such as ibuprofen (Motrin, Advil, and others) and pseudoephedrine (Afrin, Sudafed, and others). The exact information is that if the purpose is found, hypertension can regularly be controlled. [9]

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### **Additional Hypertension Types**

#### **Isolated systolic hypertension.**

Blood stress is recorded in two numbers: The upper, or first, variety is the systolic pressure, which is the strain exerted all through the heartbeat; the lower, or second, wide variety is the diastolic pressure, which is the stress as the coronary heart is resting between beats. [9]

#### **Malignant hypertension.**

This hypertension kind happens in solely about 1 percentage of human beings with hypertension. It is greater frequent in youthful adults, African-American men, and female who have being pregnant toxemia. Malignant hypertension takes place when your blood stress rises extraordinarily quickly. [9]

#### **Resistant hypertension**

If your physician has prescribed three exceptional sorts of antihypertensive medicinal drugs and your blood stress is nevertheless too high, you may additionally have resistant hypertension. [9].

#### **Signs and symptoms**

- Severe headaches
- Nosebleed
- Fatigue or confusion
- Vision problems
- Chest pain
- Difficulty breathing
- Irregular heartbeat

Blood in the urine

Pounding in your chest, neck, or ear [15]

Hypertension is not often accompanied by symptoms, and its identification is typically through screening, or when looking for healthcare for an unrelated problem. Some people with excessive blood pressure file headaches (particularly at the returned of the head and in the morning), as well as lightheadedness, vertigo, tinnitus (buzzing or hissing in the ears), altered imaginative and prescient or fainting episodes. . [15]

#### **Causes**

Factors that extend your blood stress can purpose accelerated levels. Medications such as start manipulate pills, bloodless remedies, decongestants, over-the-counter ache relievers, and some prescription tablets can also purpose a brief upward jab in blood pressure. The buildup of fatty deposits in the arteries (atherosclerosis) can additionally lead to prehypertension. Other stipulations that can also lead to prehypertension encompass the following:[18]

#### **Diabetes**

High blood strain (hypertension) can lead to many issues of diabetes, which include diabetic eye sickness and kidney disease, or make them worse. Most human beings with diabetes will sooner or later have excessive blood pressure, alongside with different coronary heart and circulation problems. Diabetes damages arteries and makes them aims for hardening, known as atherosclerosis. That can purpose excessive blood pressure, which if now not treated, can lead to bother consisting of blood vessel damage, coronary heart attack, and kidney failure.[17]

#### **Obstructive sleep apnea**

Sudden drops in blood oxygen ranges that take place in the course of sleep apnea extend blood strain and stress the cardiovascular system. Having obstructive sleep apnea will increase your chance of excessive blood strain (hypertension).Obstructive sleep apnea may additionally enlarge your hazard of recurrent coronary heart attack, stroke and atypical heartbeats, such as atrial fibrillation. If you have coronary heart disease, a couple of episodes of low blood oxygen (hypoxia or hypoxemia) can lead to surprising loss of life from an irregular heartbeat.[20]

#### **Kidney disease**

High blood strain (hypertension) is a main motive of kidney disorder and kidney failure (endstage renal disease).Hypertension can motive injury to the blood vessels and filters in the kidney, making elimination of waste from the physique difficult. Once a individual is recognized with end-stage renal disease, dialysis -- a blood-cleansing system -- or kidney transplantation are necessary. [ 19]

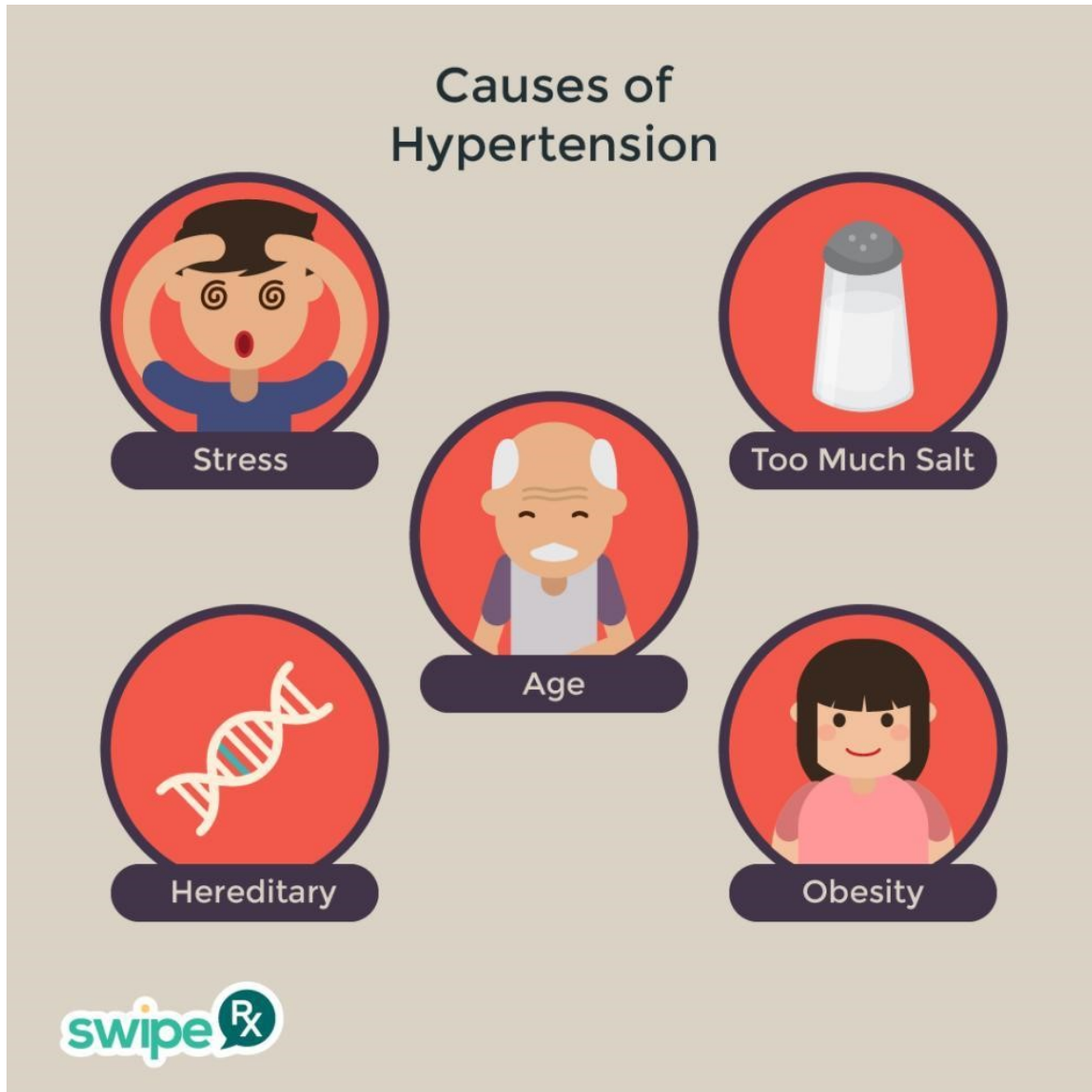
#### **Thyroid disease**

Excessive blood pressure, or hypertension is can be attributed to household records or lifestyle. For some, however, excessive blood stress is the end result of both an overactive or underactive thyroid. An overactive thyroid, regarded as hyperthyroidism, is a situation the place the thyroid gland produces too a good deal of the thyroid hormone. When too a whole lot of this hormone is produced, the coronary heart is compelled to work more difficult than usual, which will increase coronary heart charge and raises blood pressure. Hyperthyroidism is the extra frequent thyroid disease that can reason hypertension.

Conversely, hypothyroidism takes place when the thyroid gland is underactive and does now not produce ample hormones. Hypothyroidism can weaken the coronary heart muscle and coronary heart rate, decreasing the heart's pumping capability and amplify the stiffening of blood-vessel walls. The aggregate of these modifications can lead to hypertension.[16]

#### **Adrenal disease**

Pheochromocytoma. This uncommon tumor, generally located in an adrenal gland, produces too a great deal of the hormones adrenaline and noradrenaline, which can lead to long-term excessive blood strain or momentary spikes in blood pressure.Pheochromocytoma. This uncommon tumor, generally located in an adrenal gland, produces too a great deal of the hormones adrenaline and noradrenaline, which can lead to long-term excessive blood strain or momentary spikes in blood pressure.[21]



The actual reasons of excessive blood strain are now not known, however quite a few matters may also play a role, including:

Smoking

Stress

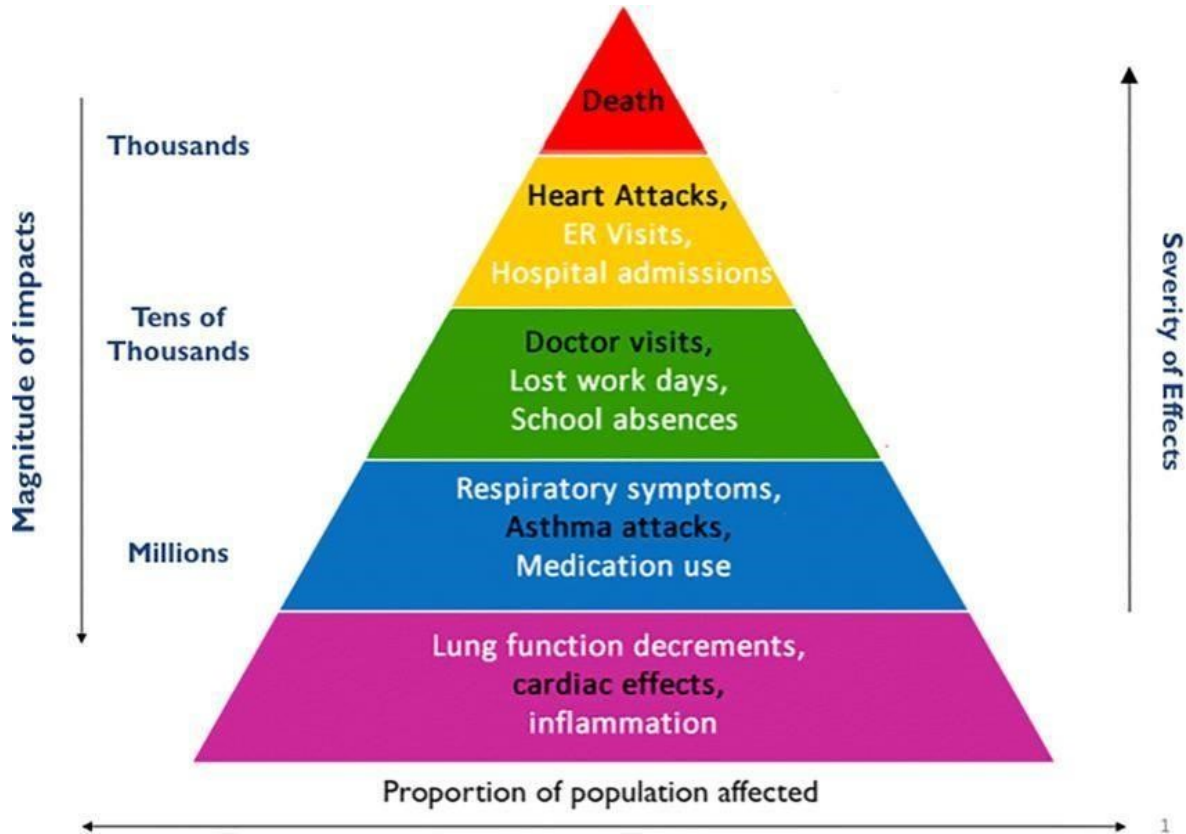
Older age

Genetics

Family records of excessive blood pressure Chronic kidney disorder [14]

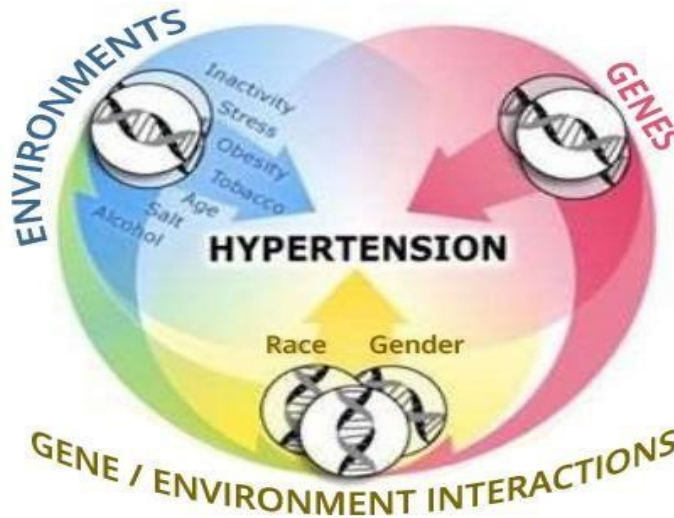
#### **Air Pollution and Noise from Road Traffic affect High Blood Pressure**

The chance of excessive blood stress or hypertension multiplied with the aid of 20% for these who stay in extra polluted areas (for each and every make bigger of 5  $\mu\text{g}/\text{m}^3$  of  $\text{PM}_{2.5}$ ) and with the aid of 6% for these dwelling in areas with a greater degree of noise. Air pollution used to be greater in Germany and Spain than in Scandinavian nations and the aggregate of air and noise air pollution was once greater in Spain and Sweden. Air pollution is a predominant environmental chance factor. There is collecting proof that air pollution should set off increased blood stress and potentiate hypertension. Acute elevations in the out of doors air pollution tiers can set off instantaneous or quickly delayed will increase in arterial blood pressure.[15]



Risk factors

## Risk Factors For Hypertension



High blood pressure has many risk factors, including

Age: The chance of excessive blood stress will increase as you age. Until about age 64, excessive blood stress is greater frequent in men.

Women are extra possibly to advance excessive blood strain after age sixty five

**Race:** High blood strain is specifically frequent amongst human beings of African heritage, frequently growing at an beforehand age than it does in whites. Serious complications, such as stroke, coronary heart assault and kidney failure, additionally are extra frequent in humans of African heritage

**Family history:** High blood pressure tends to run in families.

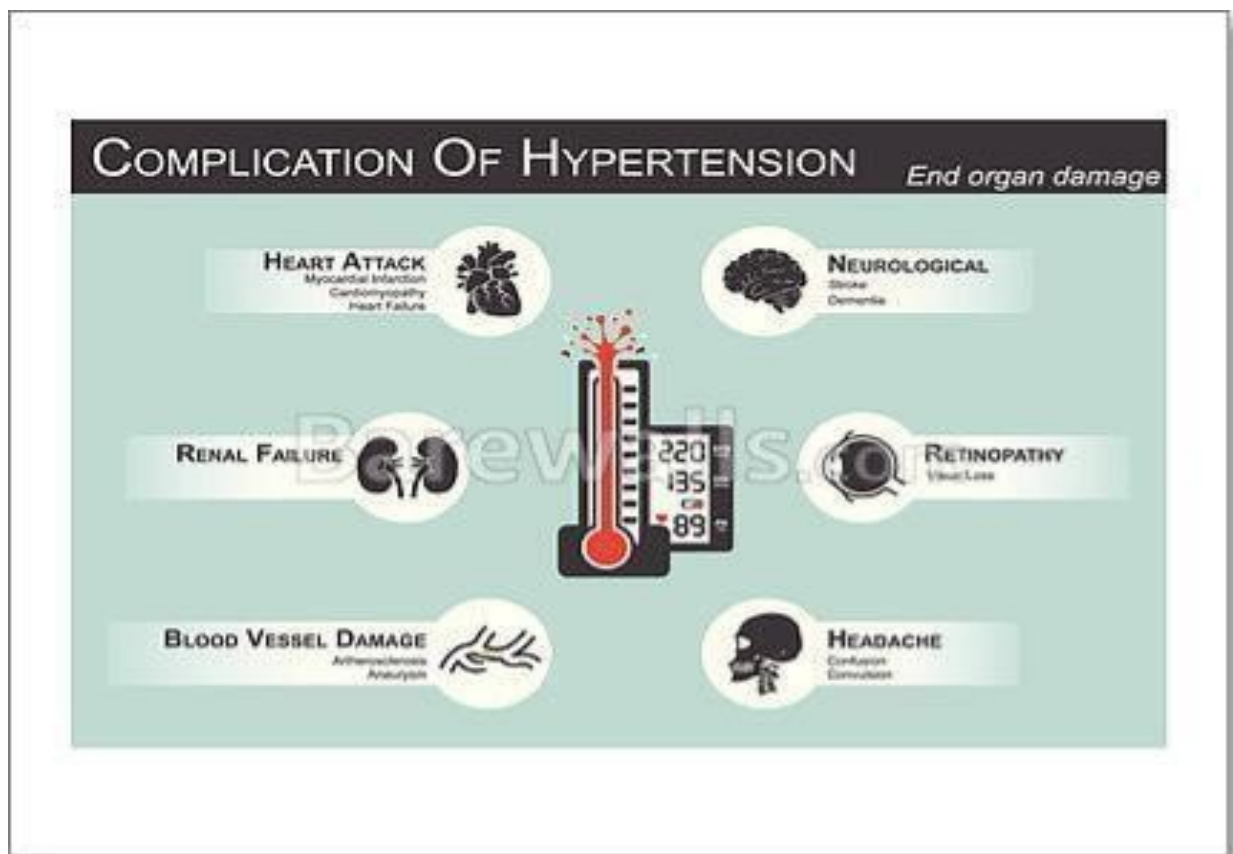
**Being overweight or obese:** The greater you weigh, the extra blood you want to furnish oxygen and vitamins to your tissues. As the quantity of blood float thru your blood vessels increases, so does the strain on your artery walls.

**Not being physically active:** People who are inactive have a tendency to have greater coronary heart rates. The greater your coronary heart rate, the more difficult your coronary heart need to work with every contraction and the better the pressure on your arteries. Lack of bodily pastime additionally will increase the threat of being overweight.

**Using tobacco:** Not only does smoking or chewing tobacco

**Too much salt (sodium) in your diet:** Too a great deal sodium in your weight loss plan can reason your physique to preserve fluid, which will increase blood pressure. [21]

### Complications



Sometimes being pregnant contributes to high blood strain as well. Although high blood strain is most common in adults, teens may be at risk, too. For some children, excessive blood pressure is precipitated by issues with the kidneys or heart. But for a growing range of kids, poor way of life habits — such as an unhealthy diet and lack of exercising — contribute to excessive blood press Complication The immoderate strain on your artery partitions triggered by using excessive blood stress can injury your blood vessels as properly as your organs. The greater your blood stress and the longer it goes uncontrolled, the higher the damage. Uncontrolled excessive blood strain can lead to problems including:

**Heart attack or stroke:** High blood strain can purpose hardening and thickening of the arteries (atherosclerosis), which can lead to a coronary heart attack, stroke or different complications.

**Aneurysm:** Increased blood strain can reason your blood vessels to weaken and bulge, forming an aneurysm. If an aneurysm ruptures, it can be life-threatening.

**Heart failure:** To pump blood towards the greater strain in your vessels, the coronary heart has to work harder. This reasons the partitions of the



heart's pumping chamber to thicken (left ventricular hypertrophy). Eventually, the thickened muscle may also have a challenging time pumping ample blood to meet your body's needs, which can lead to coronary heart failure.

**Weakened and narrowed blood vessels in your kidneys:** This can prevent these organs from functioning normally.

**Thickened, narrowed or torn blood vessels in the eyes.** This can result in vision loss.

**Metabolic syndrome:** This syndrome is a team of disorders of your body's metabolism, including increased waist size, high triglycerides, lowered high-density lipoprotein (HDL) cholesterol (the "good" cholesterol), high blood pressure and high insulin levels. These prerequisites make you more likely to develop diabetes, heart ailment and stroke.

**Dementia:** Narrowed or blocked arteries can restriction blood waft to the brain, main to a sure kind of dementia (vascular dementia). A stroke that interrupts blood float to the talent also can reason vascular dementia. [21]

### Prevention



Much of the disorder burden of excessive blood strain is skilled via humans who are no longer labeled as hypertensive. Consequently, populace techniques are required to decrease the penalties of excessive blood stress and minimize the want for antihypertensive medications. Lifestyle modifications are endorsed to decrease blood pressure, earlier than beginning medications. The 2004 British Hypertension Society recommendations proposed life-style adjustments steady with these outlined with the aid of the US National High BP Education Program in 2002 for the foremost prevention of hypertension:

Effective life-style change can also decrease blood strain as an awful lot as an man or woman antihypertensive medication. Combinations of two or extra life-style adjustments can reap even higher results. There is vast proof that decreasing dietary salt consumption lowers blood pressure, however whether or not this interprets into a discount in mortality and cardiovascular sickness stays uncertain. Estimated sodium consumption  $\geq 6\text{g/day}$  and  $\leq 3\text{g/day}$  are each related with excessive hazard of loss of life or principal cardiovascular disease, however the affiliation between excessive sodium consumption and negative consequences is solely discovered in humans with hypertension. Consequently, in the absence of outcomes from randomized managed trials, the knowledge of decreasing ranges of dietary salt consumption under  $3\text{g/day}$  has been questioned. ESC suggestions point out periodontitis is related with terrible cardiovascular fitness status.[22]

### Treatment



#### **What diet helps control high blood pressure?**

Eat ingredients that are decrease in fat, salt and calories, such as skim 23or 1% milk, sparkling veggies and fruits, and whole-grain rice and pasta. (Ask your healthcare issuer for a greater special listing of low sodium ingredients to eat.)

Use flavorings, spices and herbs to make meals tasty except the use of salt. The most appropriate advice for salt in your food regimen is to have much less than 1,500 milligrams of sodium a day. Don't forget about that most restaurant ingredients (especially quick foods) and many processed and frozen meals include excessive stages of salt. Use herbs and spices that do now not comprise salt in recipes to flavor your food. Don't add salt at the table. (Salt substitutes typically have some salt in them.)

Avoid or reduce down on meals excessive in fats or salt, such as butter and margarine, everyday salad dressings, fatty meats, total milk dairy products, fried foods, processed ingredients or quickly meals and salted snacks.

Ask your issuer if you ought to enlarge potassium in your diet. Discuss the Dietary Approaches to Stop Hypertension (DASH) eating regimen with your provider. The DASH weight-reduction plan emphasizes including fruits, greens and entire grains to your food plan whilst decreasing the quantity of sodium. Since it's prosperous in fruits and vegetables, which are naturally decrease in sodium than many different foods, the DASH weight loss plan makes it less complicated to devour much less salt and sodium.[25]

#### **What medications are used to treat high blood pressure?**

Four lessons of excessive blood strain medicinal drugs are regarded "first line" (most high quality and usually prescribed) when beginning treatment. Sometimes different medicines are coupled with these first-line capsules to higher manage your excessive blood pressure. First-line, pressurelowering medicinal drugs are:

##### **Angiotensin-converting enzyme (ACE)**

Inhibitorsblock the manufacturing of the angiotensin II hormone, which the physique naturally makes use of to manage blood pressure. When angiotensin II is blocked, your blood vessels don't narrow. Examples: lisinopril (Zestril® or Prinivil®), enalapril or captopril

##### **Angiotensin II receptor blockers (ARBs)**

Block this equal hormone from binding with receptors in the blood vessels. ARBs work the equal way as ACE inhibitors to maintain blood vessels from narrowing. Examples: metoprolol (Lopressor®; Toprol® XL), valsartan (Diovan® or Prexxartan®) or losartan.

##### **Diuretics (water or fluid pills)**

Flush excess sodium from your body, lowering the quantity of fluid in your blood. Diuretics are frequently used with different excessive blood strain medicines, on occasion in one blended pill. Examples: indapamide, hydrochlorothiazide (Microzide® or Oretic®) or chlorothiazide[26]

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## Conclusion

Hypertension is a very essential sickness in aged humans and is related with greater threat of cardiovascular morbidity and mortality. The truth of decreasing blood stress values decreases the threat for cardiac demise as properly as neurological, metabolic, and musculoskeletal device sequelae in aged people. Therefore, the intention of the antihypertensive therapy need to be to decrease cardiovascular dangers and to hold an enough first-class of existence and accurate useful capability in these patients.

Whentreating sufferers with hypertension in the oral fitness care setting, the dreams are to advance and enforce well timed preventive and therapeutic techniques well matched with the patient's bodily and emotional potential to endure and reply to dental care, the patient's social and psychological wishes and desires; and barriers imposed on the medical procedure with the aid of disease-specific, technique specific, and useful capacity-related danger factors.

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