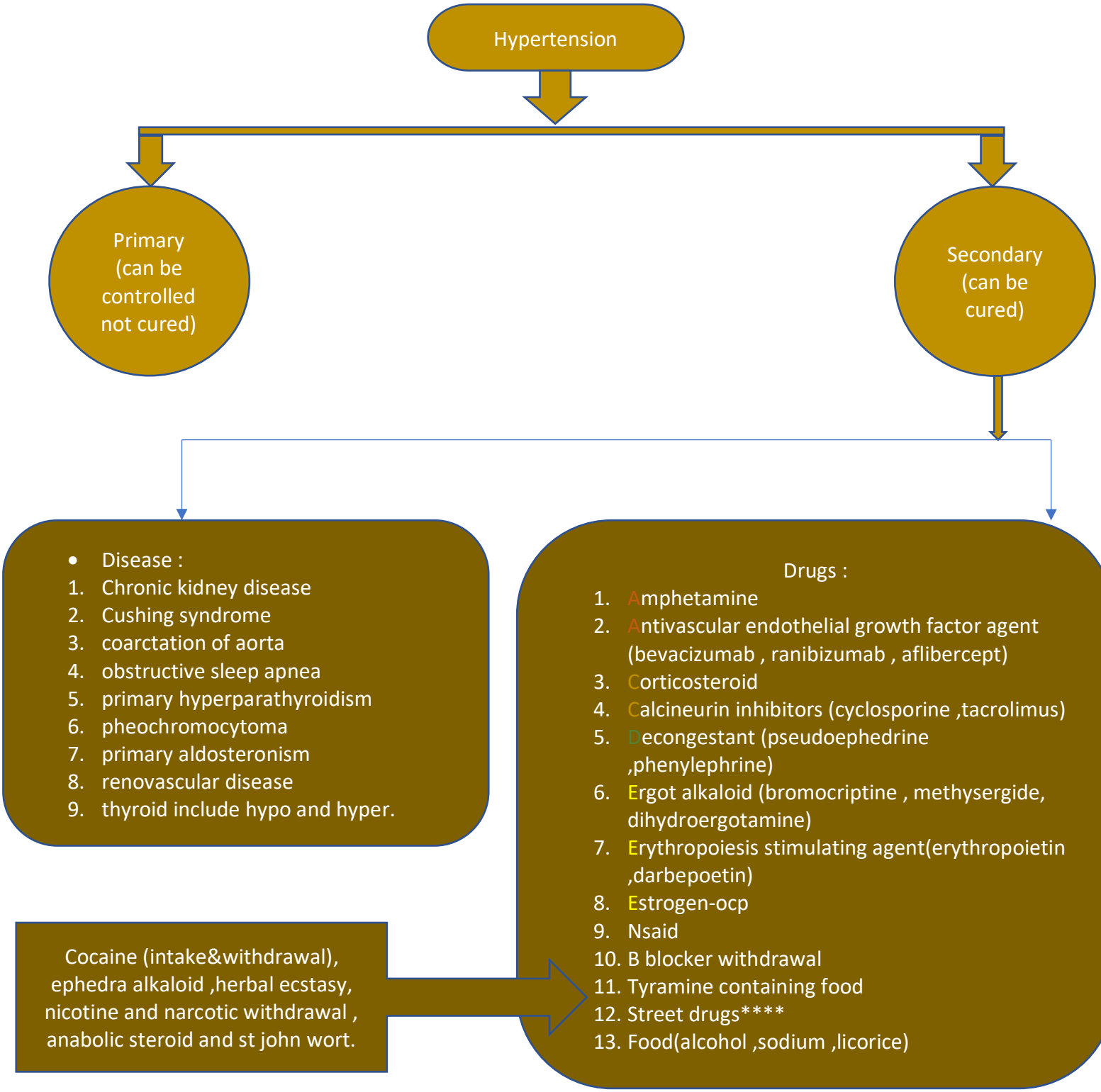

- **Our goal is to reduce mortality and morbidity from cardiovascular event.**
- **Goal bp <130/80 for < 65 years patient**
- **Goal is <140/90 for >=65 years patient**
- **Treating bp may lead to hypotension , syncope , aki , electrolyte abnormalities .**
- **Bp control rate are poor because of "clinical inertia" : clinic visit at which no therapeutic move was made to lower bp in patient with uncontrolled hypertension.**

2017 American College of Cardiology/American Heart Association Clinical Practice Guidelines Categories of Blood Pressure for Adults*			
Blood Pressure Category	**Systolic BP**		**Diastolic BP**
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120 – 129 mm Hg	and	<80 mm Hg
Hypertension: Stage 1	130 – 139 mm Hg	or	80 – 89 mm Hg
Hypertension: Stage 2	≥140 mm Hg	or	≥90 mm Hg

*Individuals with SBP and DBP in 2 different categories should be designated to the higher BP category.

Tx principles :

- **We treat by life style modification and antihypertensive drugs.**
- **The choice of the drug depend on the degree of bp elevation and presence of compelling indication.**

Treatment
No compelling indication

Life style modification

1. Gradual Weight loss (BMI:18.5-24.9)
2. Diet : rich in fruit , vegetables , low saturated fat diet
3. Reduce salt intake (1.5g/dayNa or 3.8g/day NaCl)
4. Aerobic physical activity → 40 minutes 3-4 times weekly
5. Moderate alcohol intake ما تشربوا كحول بالمرة☺

Medications

Stage 1 : first line drug or combination of two drugs
First line : ACEi , ARB , CCB,THIAZIDE
Combination : ACEI OR ARB + CCB OR THIAZIDE

Stage 2 : two first line

- ACEI OR ARB + CCB
- ACEI OR ARB + THIAZIDE

Tx with compelling indication.

Heart failure with low EF : ACEI OR ARB+ DIURETIC +B blocker (bisoprolol ,carvedilol ,metoprolol)+ possibly aldosterone receptor antagonist.
-ACEI OR ARB : start with low dose due to the risk of orthostatic hypotension.
-DIURETIC: to relieve symptoms of edema , loop diu. Used in pt with advanced HF and CKD.
-Aldosterone receptor antagonist (spironolactone or eplerenone) : lower cardiovascular morbidity and mortalilty.

Post MI : B blocker (without intrinsic sympathomimetic activity)+ACEI OR ARB
-ACEI OR ARB : lower risk of sudden cardiac death and improve cardiac remodeling
-B blocker should be used first.

Stable angina with ischemic symp.: B blocker OR CCB (non-dihydropyridine diltiazem and verapamil) + CCB (dihydropyridine)
Acute coronary syndrome: b blocker + ACEI OR ARB.
*THIAZIDE can be added therafter to lower bp but do not provide anti-ischemic effect.

DM :ACEI OR ARB + CCB

-ACEI OR ARB : provide nephro protection due to vasodilation in efferent arteriole.

-DO NOT USE NON-SELECTIVE B blocker: they mask sign and symp. Of hypoglycemia , delay hypoglycemia recovery time , they do unopposed a-receptor stimulation thus elevate bp due to vasoconstriction

-You can use selective b blocker.

CKD: ACEI OR ARB

- They reduce intraglomerular pressure , slow the progression of ckd .
- Start with low dose because patient may develop rapid and profound drop in bp especially those with renal artery stenosis and solitary kidney with stenosis.
- monitoring done by measuring serum creatinine.

Ischemic Stroke : thiazide + ACEI OR ARB

- Use only after you stabilize the patient following acute attack.

Pulmonary disease : DO NOT USE NON SLECTIVE B BLOCKER (induce bronchospasm)

Peripheral arterial disease : DO NOT USE B BLOCKER (cause vasoconstriction) , instead you can use b blocker **with** a1 block properties (carvedilol).

Elderly with HTN : thiazide + long acting dihydropyridine ccb

- Do not use centrally acting agent and a1 blocker shoud be avoided due to the risk of orthostatic hypotension.
- you can use ACEI OR ARB but in small doses .

Children and adolescent with HTN : ACEI , ARB , B BLOCKER , CCB all are acceptable

- Remember , they have secondary htn due to overweight , insulin resistance , family hx , kidney disease , coarctation of aorta .

- **Monitoring therapy**

Aldosterone antagonist , ACEI , ARB : BP ,BUN/SERUM CR , SERUM POTASSIUM

CCB , B BLOCKER : BP , HR

THIAZIDE : BP , BUN / CR , (k , Mg , Na) , uric acid , glucose

- **RESISTANT HTN :** failure to achieve goal bp with the use of 3 or more drugs

Causes : improper bp measurement , excess Na intake , inadequate therapy , non adherent , obesity , alcohol intake , osctructive sleep apnea , drugs .

- **Hypertensive crisis** > 180 /120 , include emergency & urgency

Htn emergency : with acute end organ injury (encephalopathy , ICH , retinopathy , nephropathy , pulmonary edema , left ventricular failure , dissecting aortic aneurysm , eclampsia .
Htn urgency : without end organ injury

- **Htn urgency**

1. Gradual decrease in bp , either by adding new drug or increase the dose of present drugs
2. Reduce bp to stage 1 over hours to days by using short acting **oral** medications (captopril , clonidine , labetalol).
3. Reevaluation should be done within 7 days .
4. **Do not** use nifedipine .

- **Htn emergency**

1. Immediate reduction is imp. (reduction in MAP of up to 25% within minutes to hours)
2. Use parenteral therapy (sodium nitroprusside , nitroglycerin if there is MI , fenoldopam , nicardipine and clevidipine).
3. Do not lower bp < 140 / 90 initially , after the patient become stable go for reduction until you reach goal bp . EXCEPTION : ACUTE ISCHEMIC STROKE , we need high bp for a longer time.
4. Do not use thrombolytic agent in patient with persistent > 185/110

Sodium nitroprusside
Side effect : N/V , muscle twitch , sweating ,thiocynate and cyanide intoxication .
Indication : htn emerg.
Caution : high ICP , azotemia , CKD.

Nitroglycerin :
Side effect : V , headache , methomoglobinemia,tolerance.
Indication : coronary ischemia

Clevidipine :
SE : N,headache ,tachycardia , high TG
Indication: htn emerg. Except acute HF.
Contraindication:soy or egg allergy , defective lipid metabolism , aortic stenosis.

Nicardipine
SE : tachy , headache,flushing,local phlepitis
Indication:same as clevidipine
Caution: coronary ischemia

Enalaprilat
SE:precipitous fall in bp,variable response
Indication : acute LV failure
Avoid in mi and eclampsia

Esmolol
SE:N,hypotension, asthma,1st heart block,HF
Indication:aortic dissection
Avoid in bradycardia,decompensated HF, b blocker users

Fenoldopam
SE:tachy,headache ,N,flushing
Indication: htn emerg
Caution:glaucoma

Hydralazine
SE:tachy,flushing,headache,V,aggravation of angina
Indication:eclampsia

Labtalol:
SE: N, V ,heart block,dizzines,orthostatic hypotension,scalp tingling,bronchoconstriction.
Indication: htn emerg. Except HF OR BLOCK