

CARDIOVASCULAR SYSTEM

SUBJECT : _____

LEC NO. : 8

DONE BY Tabark Aldaboubi, Raneem Azzam

وَقُلْ رَبِّ زِدْنِي عِلْمًا



SCAN ME!

CVS- Pharmacology 8 Antihypertensive3

Faculty of Medicine

The Hashemite University

Arwa Al Anber (MD, PhD)

Office: 1018

التفاريغ بنكهة الاستقلال 🇂🇩🇂🇩🇂🇩🤗

حنا اردنيه 🇂🇩🇂🇩🇂🇩



عيد الاستقلال

Alpha blocking agents

- α -Adrenergic blockers used in the treatment of hypertension include **prazosin, doxazosin and terazosin**. These agents produce a competitive block of α 1-adrenoceptors.
- They decrease peripheral vascular resistance and lower arterial blood pressure by causing relaxation of both arterial and venous smooth muscle.
- Reflex tachycardia and postural hypotension often occur at the onset of treatment.
- ✳️ • α -blockers are no longer recommended as initial treatment for hypertension but may be used for refractory cases.

نبلش نحكي عنا ال alpha blocking agent ، طبعا هاي الادوية بتكون mainly specific لل alpha 1 ، و ال alpha 1 بالاساس بتعمل vasoconstriction ، ولما نعملها block رح تعمل vasodilation و رح تقل ال peripheral vascular resistance ، و بشتغل على ال arteries and veins ، بنسخدمها لعلاج ال hypertension لكن مش first line .

كل هاي الادوية بتنتهي ب zosin .

ممکن يعمل reflex tachycardia ، و postural hypotension بتصير مع بداية العلاج و ممکن تخف مع الوقت .

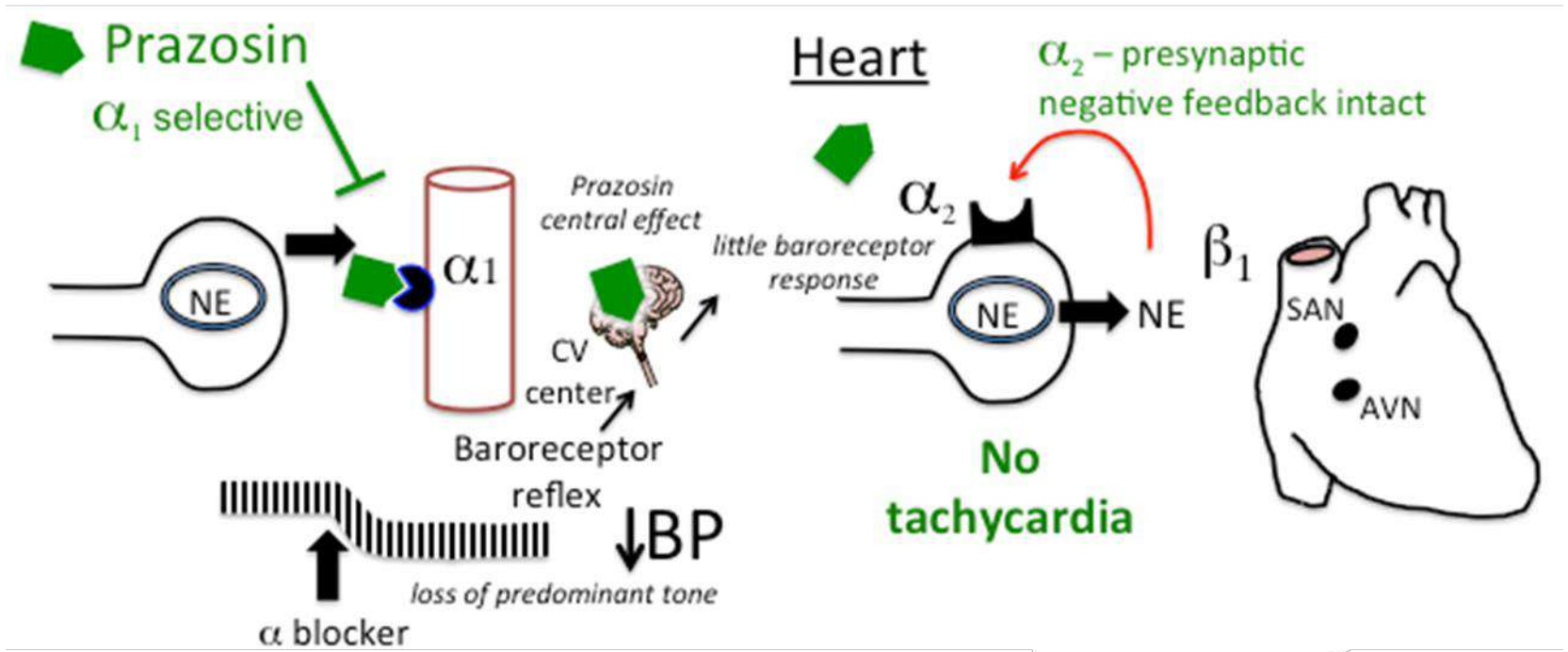
هو مش first line ، لكن بستخدمه بحالات ال refractory cases ، يلي هم ما بستجيبيوا لباقي الادوية.

ملاحظة : مش كل ادوية الضغط بتعمل reflex tachycardia ، لكن مثلا هون ال alpha blockers ما بتشتغل على القلب و تأثيرها فقط على ال blood vessels ليهك بصير عنا tachycardia ، كرد فعل طبيعي من الجسم

هون بفرجيك كيف بصير في reflex tachycardia ، الفكرة انه ال baroreceptors بتصير توصل impulses اقل و بالتالي بصير الجسم بده يرفع الضغط فبزيد ال sympathetic tone و بزيد ال myocardial contractility

Alpha blocking agents

✳ للتوضيح فقط



طيب سريع سريع حنكي عن ال alpha 2 receptors ، هاي بتكون موجودة على ال precynaptic neurons ، و اذا ارتبطت ب agonist بتعمل تثبيط لافراز ال neurotransmitter

لما رح نحاكي عنها فحسب لوسيلة ضروري لفهمنا الفكرة

Centrally acting adrenergic drugs

- **A. Clonidine**

- *Clonidine* acts centrally as an α_2 agonist to produce inhibition of sympathetic vasomotor centers, decreasing sympathetic outflow to the periphery. This leads to reduced total peripheral resistance and decreased blood pressure.

- ✦ *Clonidine* is used primarily for the treatment of hypertension that has not responded adequately to treatment with two or more drugs.

used
①

- *Clonidine* does not decrease renal blood flow or glomerular filtration and, therefore, is useful in the treatment of hypertension complicated by renal disease.

used
②

- Rebound hypertension occurs following abrupt withdrawal of *clonidine*. The drug should, therefore, be withdrawn slowly if discontinuation is required.

}
✦
✦
✦

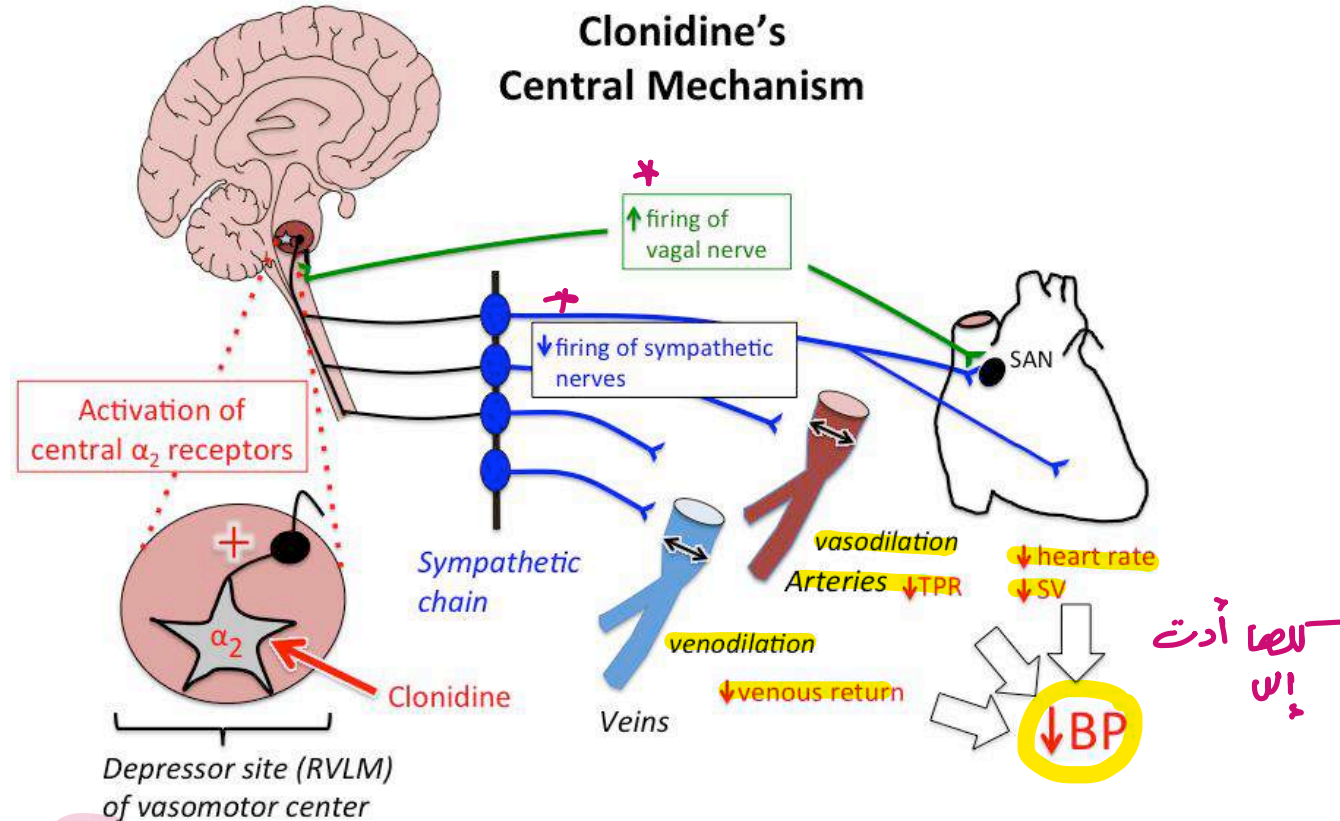
باختصار هاي الادوية عبارة عن alpha 2 agonists و انا شرحت فوق آلية عملهم ، و باختصار هم يعملوا تثبيط لل sympathetic action و بالتالي vasodilation و قل ال BP .

هاي الادوية بستخدمها لما المريض ما يستجيب لباقي الادوية ، يعني مش first line.

ما بقلل من ال renal blood flow ، لهيك كويس للمرضى يلي عندهم مشاكل بالكلية.

ما بزبط اووقف الدواء هذا مرة وحدة ، لازم شوي شوي ، عشان بكون صار upregulation لل postsynaptic receptors ، و هيك اذا وقفته فجأة بصير عندي sympathetic tone عالي جدا ، وبصير عندي rebound hypertension .

Centrally acting adrenergic drugs



هون الدكتورة بدهاش تفصيل ، بس الفكرة انا عملت decreased بال sympathetic tone ، فزاد عمل ال parasympathetic action ، و قل عندي ال stroke volume و ال PVR و BP

Centrally acting adrenergic drugs

B. Methyldopa

- An α agonist that is converted to methylnorepinephrine centrally to diminish adrenergic outflow from the CNS. *بقلل ال sympathetic activity*
- The most common side effects of methyldopa are sedation and drowsiness. Its use is limited due to adverse effects and the need for multiple daily doses. *كل ما زدت ال dose ين زي ال side effect*
- It **is mainly used for management of hypertension in pregnancy.**



لأنو safe عليهم

هذا دواء ثاني نفس فكرة ال clonidine، و هذا الدواء يتميز بال side effect تااعته ، فبعملي sedation و drowsiness

فن الهمم بملوحنا VD

Vasodilators

- They are direct-acting smooth muscle relaxants, such as **hydralazine and minoxidil**.

 hairgrowth  الواسطوانات اخرى
منها انو بزيده ال

- Are not used as primary drugs to treat hypertension.

يعني
→ It's not used in first line

شغلها 

- These vasodilators act by producing relaxation of vascular smooth muscle, primarily in arteries and arterioles. This results in decreased peripheral resistance and, therefore, blood pressure. $\downarrow\downarrow BP$



مثل ما حكينا اي اشى بعمل vasodilation ممن يعمل reflex tachycardia ، و بالتالي بصير في استهلاك للاوكسجين لانه القلب بعمل contraction بشكل سريع و بده دم اكثر و بالتالي بصير في عنا angina

Vasodilators

← يعني هو كان منبع قلك الـ BP بس عندى مشكالتين >

- Produce **reflex stimulation of the heart**, resulting in the competing reflexes of increased myocardial contractility, heart rate, and oxygen consumption. * لازم اتكون حذر لانوعهاي كلها side effect
- ⊙ These actions may prompt angina pectoris, myocardial infarction, or cardiac failure in predisposed individuals.
- ⊙ Vasodilators **also increase plasma renin** concentration, resulting in sodium and water retention.
- * * These undesirable side effects can be blocked by concomitant use of a diuretic (to decrease sodium retention) and a beta-blocker (to balance the reflex tachycardia).
- Together, the three drugs decrease cardiac output, plasma volume, and peripheral vascular resistance.

BP

حتى
اقل
عن

مشكالتين

Vasodilators

B. Methyldopa

- **Hydralazine** is used for controlling blood pressure in **pregnancy** induced hypertension. ← ↑ دواءنا في الحمل
لا حوامل
- **Adverse effects: precipitation of angina, (and s lupus-like syndrome)** can occur with high dosages, but it is reversible upon discontinuation of the drug.
- **Minoxidil** treatment causes **hypertrichosis** (the growth of body hair).

DRUG CLASSES INDICATED IN TREATING HYPERTENSION

CONCOMITANT DISEASE

STABLE ISCHEMIC HEART DISEASE		β -Blockers	ACE inhibitors	ARBs	Ca ²⁺ channel blockers
DIABETES	Diuretics		ACE inhibitors	ARBs	Ca ²⁺ channel blockers
RECURRENT STROKE	Diuretics		ACE inhibitors	ARBs	
HEART FAILURE	Diuretics	β -Blockers	ACE inhibitors	ARBs	Aldosterone-receptor antagonists
PREVIOUS MYOCARDIAL INFARCTION		β -Blockers	ACE inhibitors		Aldosterone-receptor antagonists
CHRONIC KIDNEY DISEASE			ACE inhibitors	ARBs	

حافيا بلوگر β

هسعات ودنا نحكي عن ال hypertensive emergency ، هذا عبارة عن hypertension بعلمي organ dysfunction ، هون احنا مش كثير بنهتيم بقديش بكون الضغط بقدر ما بنهتيم بتأثيره ، يعني هو اخذ هذا الاسم لانه عملي organ dysfunction ، لكن بالعادة بكون الضغط:

the systolic BP is usually >180 mmHg and/or the diastolic BP is >120 mmHg.

← ممكن مع بعضا واحد وزعم

معلومة مهمة ، هون انا غلط انزل الضغط بشكل سريع ، لانه حيصير في more side effects ، لانه ممكن احنا نقلل ال blood flow لهاي ال organs

******هسا لو مثلا مريض مرتفع ضغطه وصار عندو نزيف واجيت انا انزل صغطو مرة وحدة ممكن انه ياتي او اخرب اعضاء المريض ،،، مثلا اجاني مريض عندو نزيف في الدماغ ورح يادي ل edema in brain وهي كمية الدم رح تزيد في الدماغ طب شو رح يصير ب الbv؟؟؟ رح يصير عليها pressure from the outside يعني يصير لها collapse (الضغط داخل الشرايين رح يكون قليل لهيك رح يصير الانكماش) مشان هيك بديش ينزل الضغط مرة وحدة عشان احافظ على ال blood flow وما يصير organ damage ،،، نفس الشئ لباقي لاعضاء

Hypertensive emergency

- Severely elevated blood pressure (BP) associated with new or progressive target organ dysfunction.
- Although the absolute value of the BP is not as important as the presence of end-organ damage, the systolic BP is usually >180 mmHg and/or the diastolic BP is >120 mmHg.
- ~~The initial goal of therapy is to reduce mean arterial BP by no more than 25% (within minutes to 1 hour).~~
- Normal BP may be targeted over the next 24 to 48 hours.
- Excessive falls in pressure may precipitate renal, cerebral, or coronary ischemia and so should be avoided.

Hypertensive emergency

- **Clinical features of hypertensive emergency include:**
- Hypertensive encephalopathy: Headache, Visual disturbance, Nausea & vomiting, Confusion, Seizures, Drowsiness and Coma
- Hypertensive retinopathy
- Hypertensive cardiomyopathy: Angina
- Hypertensive nephropathy: Oliguria
- Intracerebral hemorrhage: coma, focal neurological signs
- Aortic dissection → Tear in Aorta
- Eclampsia: Seizures in late pregnancy

Hypertensive emergency

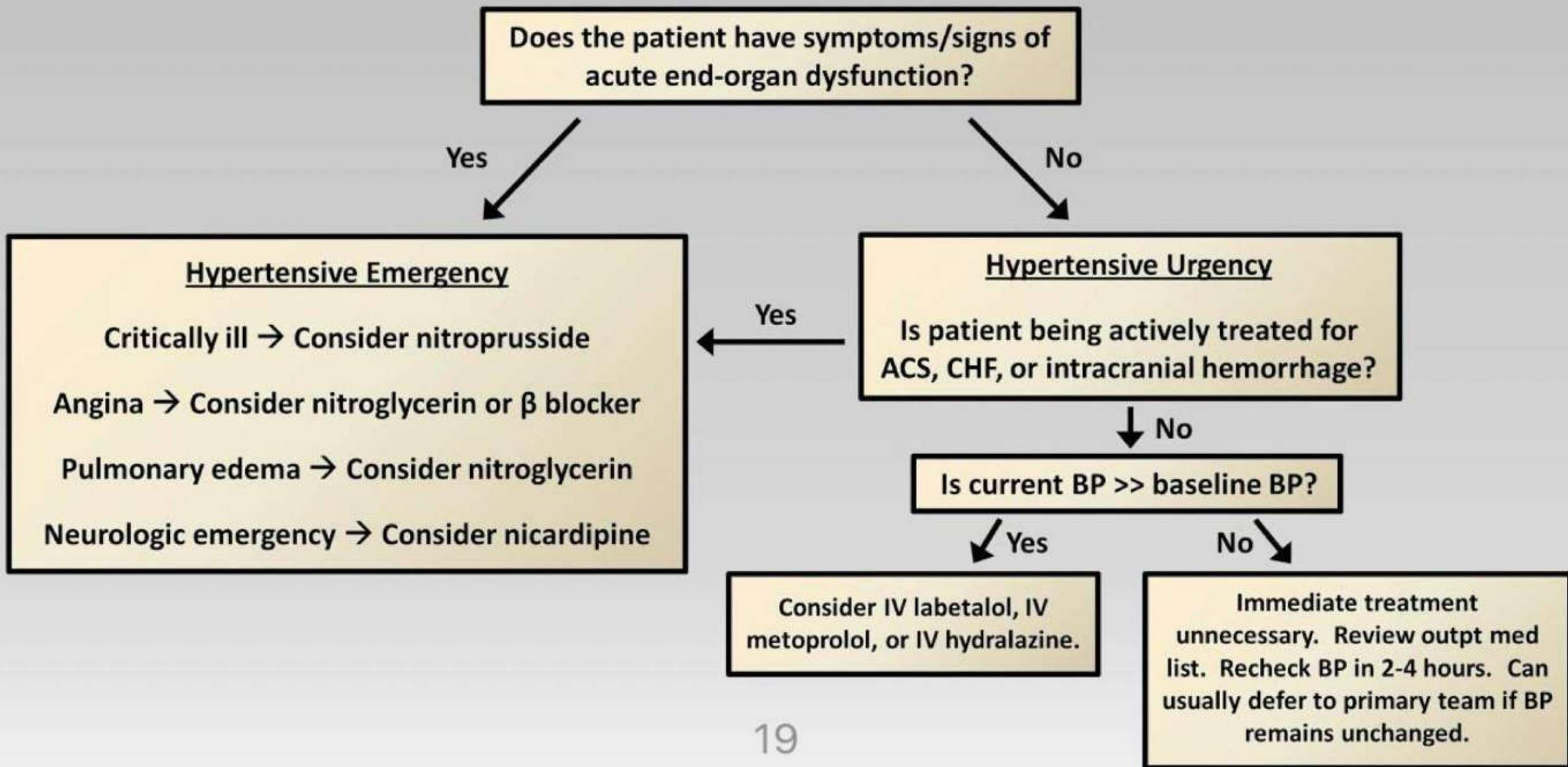
- **Initial investigation of hypertensive emergency**
- CT head
- Fundoscopy
- 12-lead ECG
- Urinalysis
- Urea & electrolytes → renal function عشان نشوف ال
- Chest radiograph (CXR)

Hypertensive emergency

- **Initial management of hypertensive emergency**
- Assess the patient from an ABCDE perspective
Airway Breathing circulation Decontamination exposure
- Controlled BP reduction; rapid BP reduction should be avoided because this may compromise blood flow to tissues.
gradually decreased لئلا ينزل
- Pharmacological options are:
 - ✓ Nitroprusside IV *intravenous*
 - ✓ Labetalol IV
 - ✓ Nitrates IV

عسر وعلو ب النفاير

Order Treatment



هاي يعني المريض هسة بوخذ ٣ ادوية لكن لسة الضغط ما حافظنا عليه

Resistant hypertension

و حنكي عن الاسباب يلي بتعمللنا هاي الحالة

- Blood pressure that remains elevated (above goal) despite administration of an optimal three-drug regimen.
- I. The most common causes of **resistant hypertension are poor compliance, excessive ethanol intake.**
- II. **Concomitant conditions** (diabetes, obesity, sleep apnea, hyperaldosteronism, high salt intake, and/or metabolic syndrome).
- III. **Concomitant medications** (sympathomimetics, nonsteroidal anti-inflammatory drugs, or corticosteroids).
- IV. Insufficient dose and/or drugs, and use of drugs with similar mechanisms of action.

العريض عس
علترم

يعني بوخذ واحد
فدا الادوية الموصوفة الهوتلنا الباقيا او ما بوخذ الدوا بالجرعة المحددة

له بوخذ ادوية بترفع الضغط


هون بدنا نحاول نعمل treatment لهاي الامراض، better
treatment of diabetes ، ننزل الوزن ووو الخ

بدنا نحاول نخفف منها او نعطي بدالها

A 59-year-old non-Hispanic white patient presents for treatment of hypertension. His past medical history also includes diabetes, hyperlipidemia, and hypertension. The patient's blood pressure is 150/93 (both today and at the last visit). Which is a recommended initial therapy to treat hypertension in this patient?

- A. Enalapril
- B. Hydralazine
- C. Verapamil
- D. Metoprolol

A 52-year-old female has uncontrolled hypertension (blood pressure 154/82 mm Hg) on treatment with lisinopril. She recently had a myocardial infarction, and her past medical history includes diabetes, hypertension, hyperlipidemia, and osteoarthritis. Considering her compelling indications, which agent may be appropriate to add to her antihypertensive therapy?

- A. Clonidine
- B. Olmesartan
- C. Furosemide
-  D. Metoprolol

Which of the following correctly outlines a major difference in electrolyte disturbances associated with thiazide and loop diuretics?

- A. Thiazide diuretics decrease potassium and loop diuretics increase potassium.
- B. Thiazide diuretics increase potassium and loop diuretics decrease potassium.
- C. Thiazide diuretics decrease calcium and loop diuretics increase calcium.
- ✓ D. Thiazide diuretics increase calcium and loop diuretics decrease calcium.

Which can precipitate a hypertensive crisis following abrupt cessation of therapy?

- A. Clonidine
- B. Diltiazem
- C. Valsartan
- D. Hydrochlorothiazide

Enhancement of the effects of bradykinin is most likely to occur with which of the following drug?

- (A) clonidine
- (B) diazoxide
- (C) lisinopril
- (D) losartan
- (E) propranolol

Selective β -1 blockers are preferred over nonselective beta blockers in some patients because they

- (A) cause less cardiodepression
- (B) are less likely to cause bronchoconstriction
- (C) are more effective for migraine prophylaxis
- (D) are more effective as an antiarrhythmics
- (E) have greater prophylactic value post-MI

Which one of the following is the most appropriate drug to use for the patient described in parentheses?

- (A) Captopril (60-year-old woman with diabetic nephropathy)
- (B) Propranolol (40-year-old diabetic man)
- (C) Losartan (29-year-old pregnant woman)

Which side effect is associated with spironolactone?

- (A) Alkalosis
- (B) Hirsutism
- (C) Hyperkalemia
- (D) Hypercalcemia
- (E) Hyperglycemia

هالمرة الصورة من مكتبي 😂🤔
وطبعًا هيكلي جاي يوصللكم رسالة ويذكركم
قديش ضايل للسيستم 😂👉



شكو الهمة واستمروا بالسعي وربنا بيبارك بمسعاكم واوقاتكم بالتوفيق 🙏❤️
ولا تنسوني انا ورنيم من دعواتكم 🙏
وادعو لزميلنا معاذ المعايطة ، ربنا يشافيه ويعافيه 🙏

