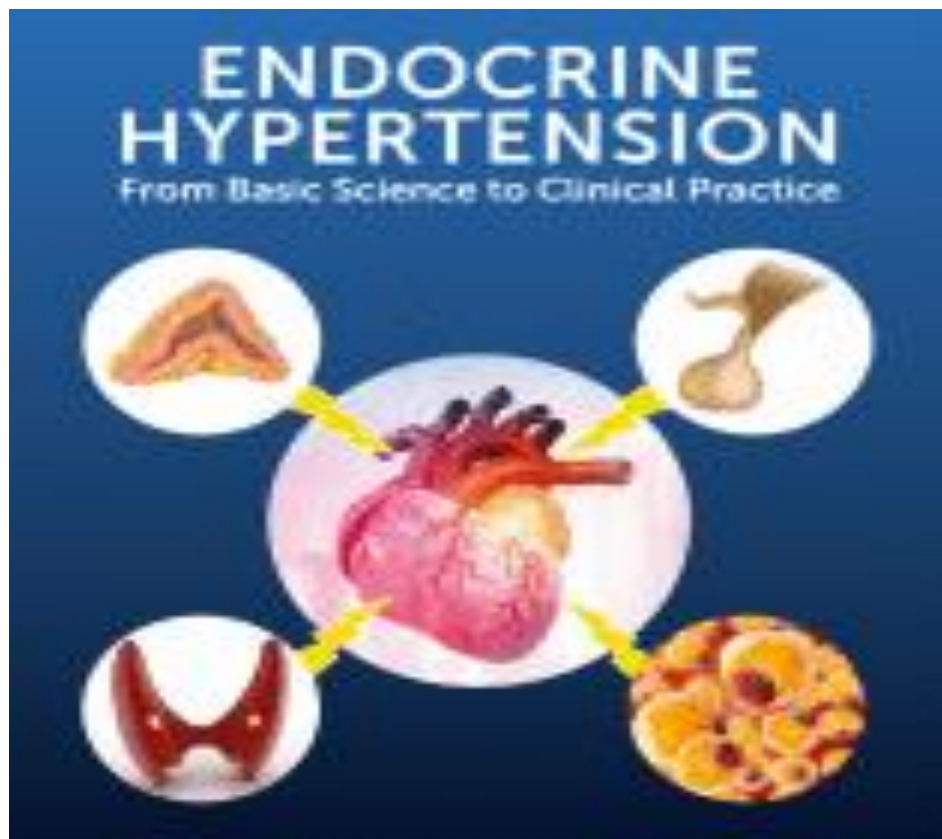


*In the name of
God*





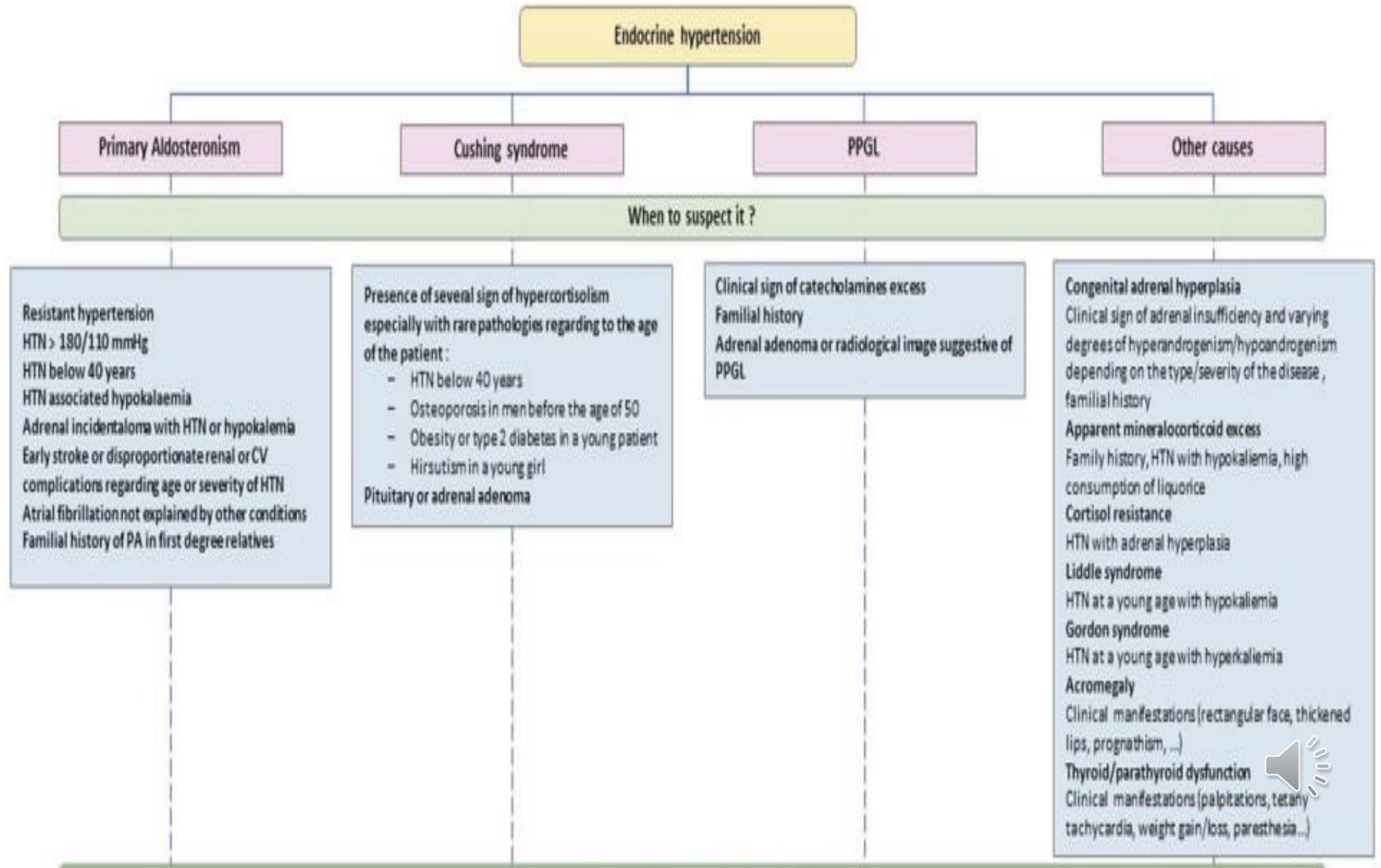
Farahnoosh Farnood
Assistant Professor of Nephrology
Kidney Research Center



Outline:

- **Importance of Secondary Hypertension**
- **Incidence and Screening Criteria**
- **Recommendations for Screening**
- **Importance of Timely Screening**





REVIEW ARTICLE

| Originally Published 24 July 2024 |



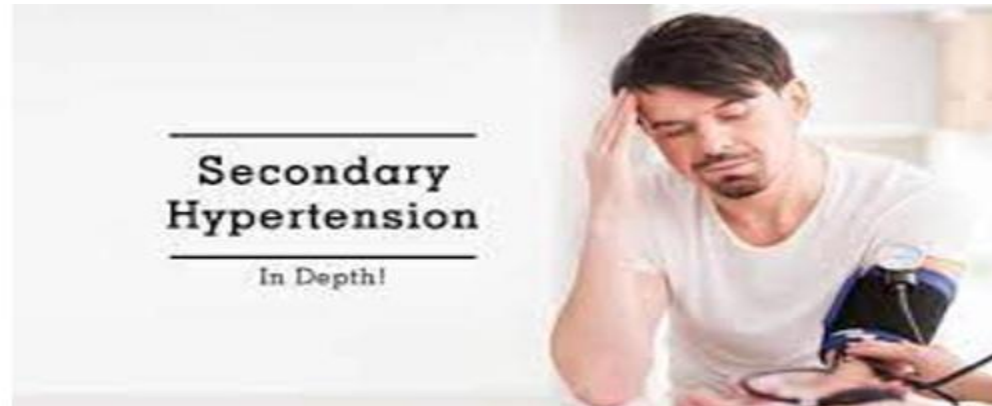
Clinical Management of Primary Aldosteronism: An Update

Gian Paolo Rossi  , Federico Bernardo Rossi, Chiara Guarnieri, Giacomo Rossitto , and Teresa M. Seccia  | [AUTHOR INFO &](#)

[AFFILIATIONS](#)

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Textbooks from the 10th edition of Harrison's and guidelines report that 95% to 99% of patients with high blood pressure (BP) would have primary (essential) hypertension as recently reviewed. Hence, secondary hypertension is regarded as exceptional and thus neglected in clinical practice.



Compelling accumulating evidences indicate instead that, when thoroughly investigated, secondary hypertension is highly prevalent. This applies particularly to primary aldosteronism (PA), which is rarely diagnosed, despite being surgically curable in many cases.



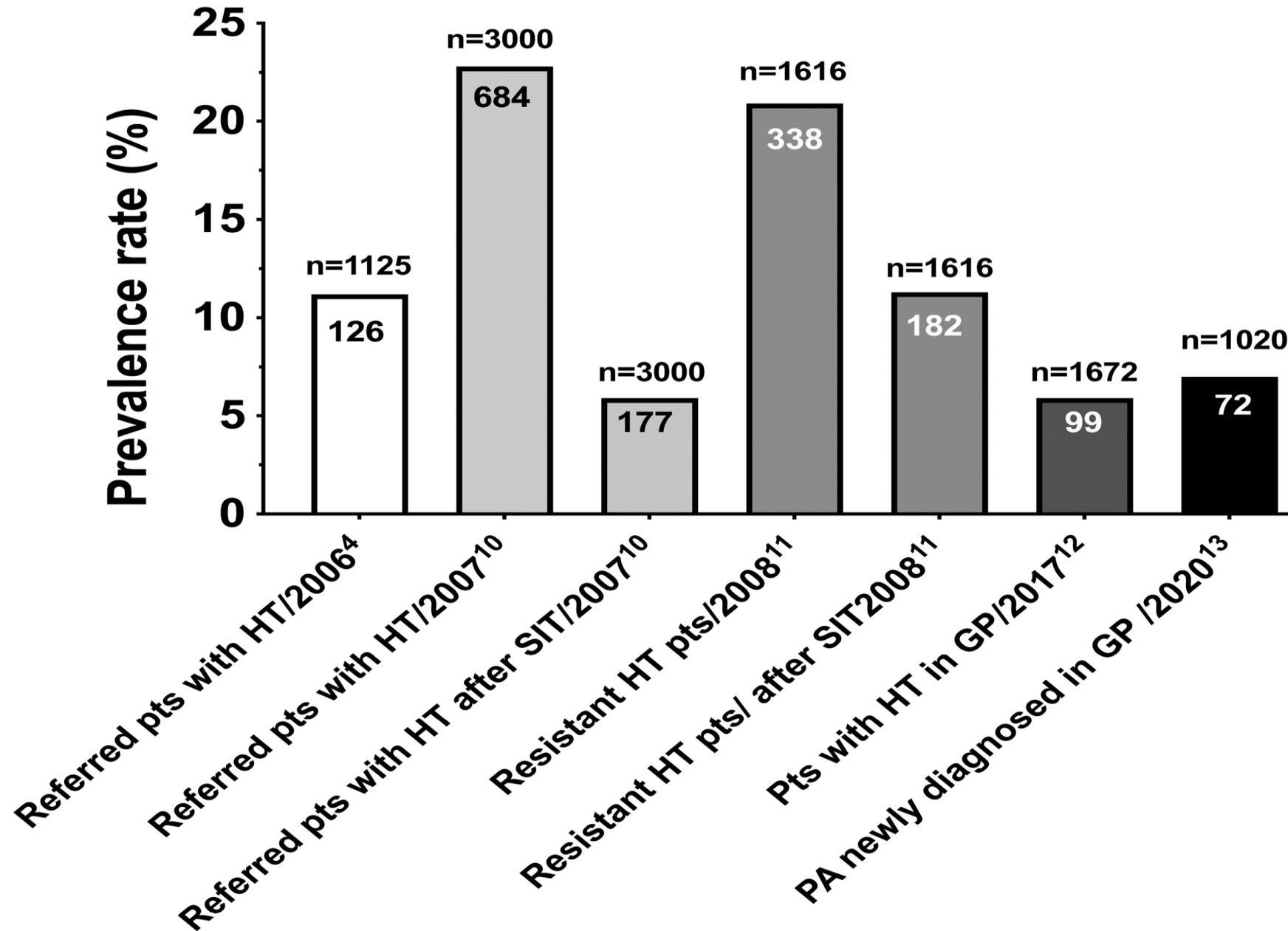
This *is tragic* because PA detrimentally affects the heart, arterial wall, and kidneys, causing cardiovascular events that can be prevented with early diagnosis and targeted treatment.



PREVALENCE OF PA

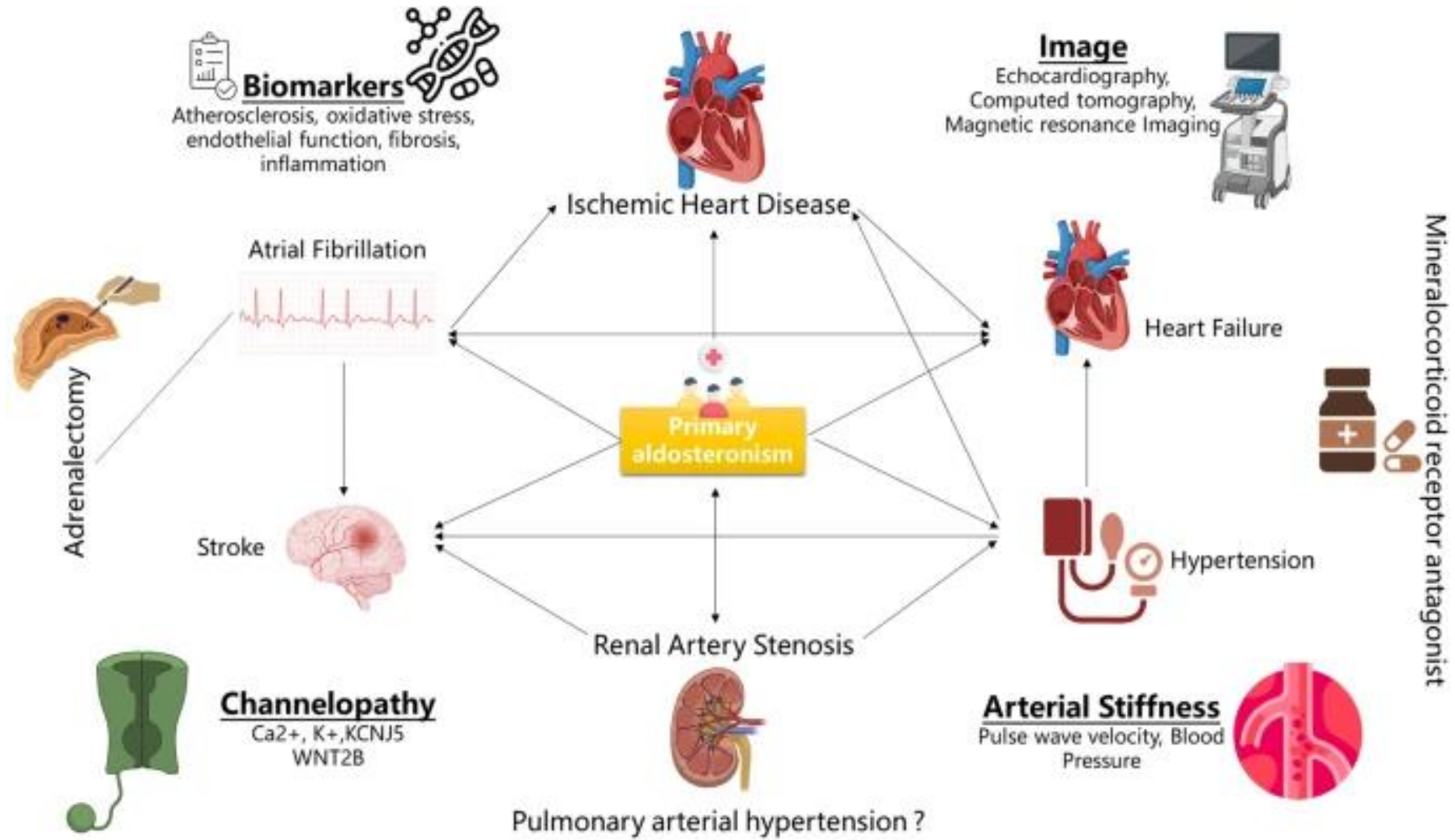
A wide range of estimates of PA prevalence exists, which are mainly explained by differences in patient populations, screening protocols, and diagnostic criteria.

PA Prevalence in studies that recruited > 1,000 Pts with HT



CARDIOVASCULAR DAMAGE IN PA





**WHY IS PA SO MARKEDLY UNDERDETECTED DESPITE ITS
DETRIMENTAL CONSEQUENCES?**



1-Misconceptions about the rarity of this disease

2-Misconception about the absolute existence of hypokalemia

۳ -Errors in the interpretation of plasma aldosterone levels

4- variable secretion of aldosterone



**Patients With HT That Must Be Screened
Because of High Prior Probability of
Primary Aldosteronism**



1-Drug-resistant HT by current definitions Systolic-diastolic HT (BP >150/100)

2-Spontaneous or diuretic-induced hypokalemia

3-Incidentally discovered adrenal mass (incidentaloma)

4-Sleep apnea

5-Family history of PA and early-onset HT or CA at a young age

6-Unexplained atrial fibrillation

7-LVH, diastolic dysfunction, microalbuminuria, chronic kidney disease in excess of what expected based on BP values.

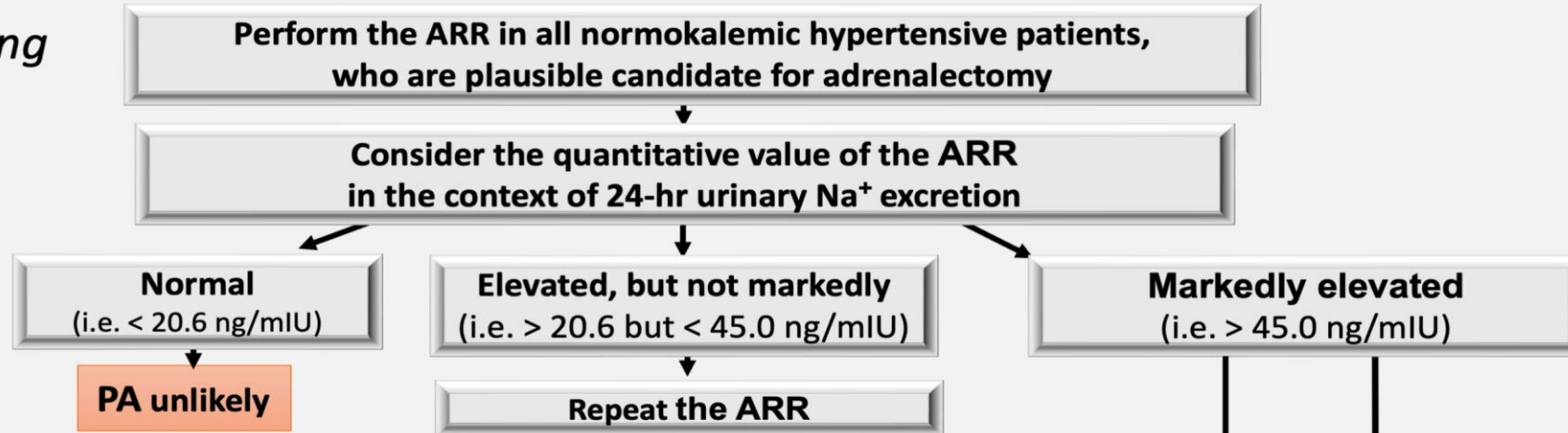


8-Women with HT planning a pregnancy

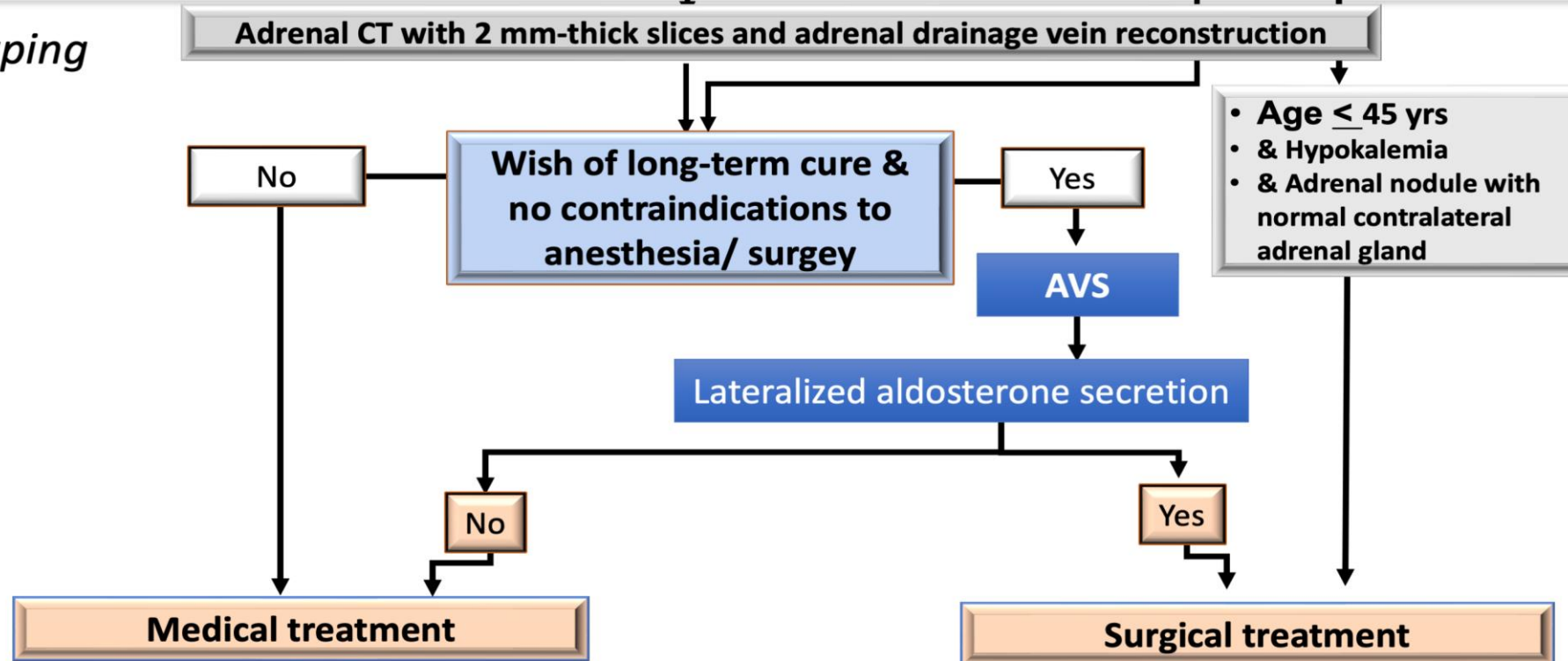


Simplified Algorithm for PA Screening and Work-up

Screening



Subtyping



Serum levels of potassium:

Marked hypokalemia lowers aldosterone secretion and should be corrected before performing the test to avoid FN ARR values



Estimation of salt intake by measuring 24-h urinary sodium excretion allows to identify **FP cases due to a low salt intake and diuretics that increase PAC.**

6 wk before testing withdraw:

1-diuretics as they raise renin and, if they caused hypokalemia, PAC can be factitiously low

2-RAS blockers (ACE inhibitors and ARBs) as they raise renin and lower PAC thus causing FN results.



Given the 15 min half-life of plasma renin and aldosterone, after 1 h their values are back to baseline (clinostatic) values.

Hence, keep the patient resting, supine, or sitting for 60 min before sampling.



**Long-acting calcium channel blockers
(verapamil), α 1-receptor blocker (doxazosin)
should be used.**

**MRAs are advised, if necessary to control BP
or to ensure normokalemia**



Calculate the ARR in the correct unit of measure using ARR-App.



Pheochromocytomas and paragangliomas



Paragangliomas and pheochromocytomas (PGL) are tumours that can develop in the thoracic-abdominal-pelvic sympathetic ganglia located along the spine or in the parasympathetic ganglia located at the cervical level and at the base of the skull. More specifically, PGL arising in the adrenal medulla is called pheochromocytoma.



HTN is the most frequent clinical sign, present in more than 80% of patients .It can be permanent or paroxysmal in the form of hypertensive attacks. However, orthostatic hypotension can sometimes be associated. Due to the rarity of the disease, the average time to diagnosis is about 3 years.



Biological diagnosis is based on the determination of metanephrines (MN) (including metanephrine and normetanephrine) which are the degradation products of CTN.

These assays can be performed in plasma or on a 24 h urine collection (and associated with a 24 h urine creatinine assay to ensure correct collection)



A normal MN value excludes the presence of a secreting PGL. Conversely, a result greater than 4 times the upper limit is in favour of tumour secretion.



Screening for secretory PGL is indicated in patients

1- HTN
diagnosed before
40 years old

2- blood pressure
lability on
ambulatory blood
pressure
monitoring

3-a history of
Takotsubo heart
disease

4- any adrenal
incidentaloma
associated or not
with HTN

5-resistant HTN



**6-any genetic disease
predisposing toPGL**

**7-a history of hypertensive
crisis or haemodynamic
instability during general
anaesthesia or after taking
drugs that induce
catecholamine release**

**8- HTN associated with
diabetes (not type 1), with
a body mass index < 25
kg/m² in a patient under 50
years of age**



Magnetic resonance imaging (MRI) is only preferred when looking for a cervical paraganglioma. In certain specific indications, functional imaging using positron emission tomography (PET) may complete the initial imaging work-up.



Cushing syndrome



Cushing's syndrome (CS) is the result of prolonged exposure to glucocorticoids. Except for exogenous administration of supra-physiological doses of glucocorticoids, this is a **rare disease** with an incidence estimated between 1 and 5 million person-years. Its prevalence is estimated to be about 0.5% in hypertensive patients



Recommended to screen:

1- patients presenting several signs related to CS, especially if the patients present rare pathologies regarding to their age (HTN before the age of 40).

2-osteoporosis in men before the age of 50.

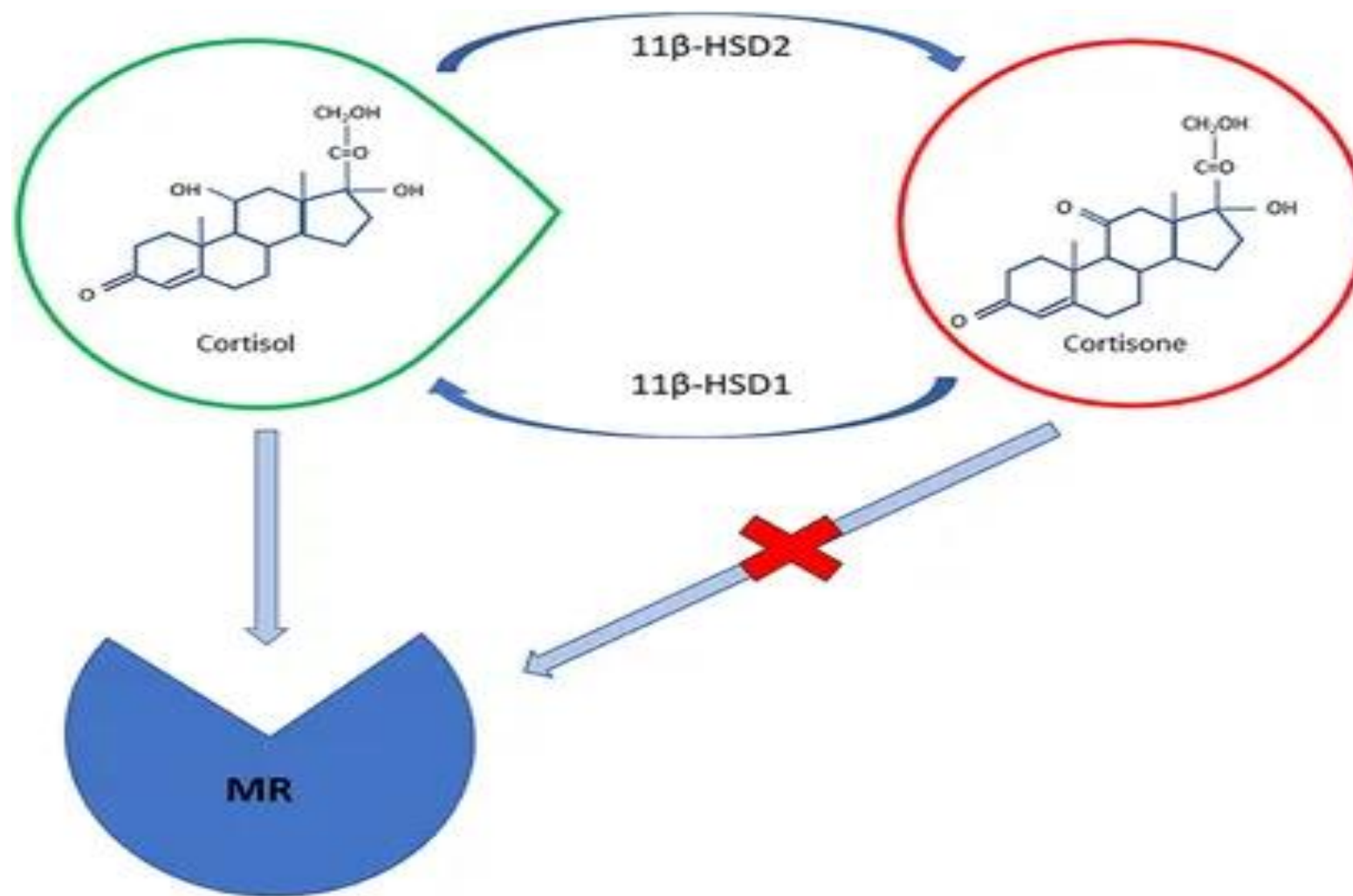
3- obesity or type 2 diabetes in a young patient.

4-hirsutism in a young girl) and patients presenting a pituitary or adrenal adenoma.

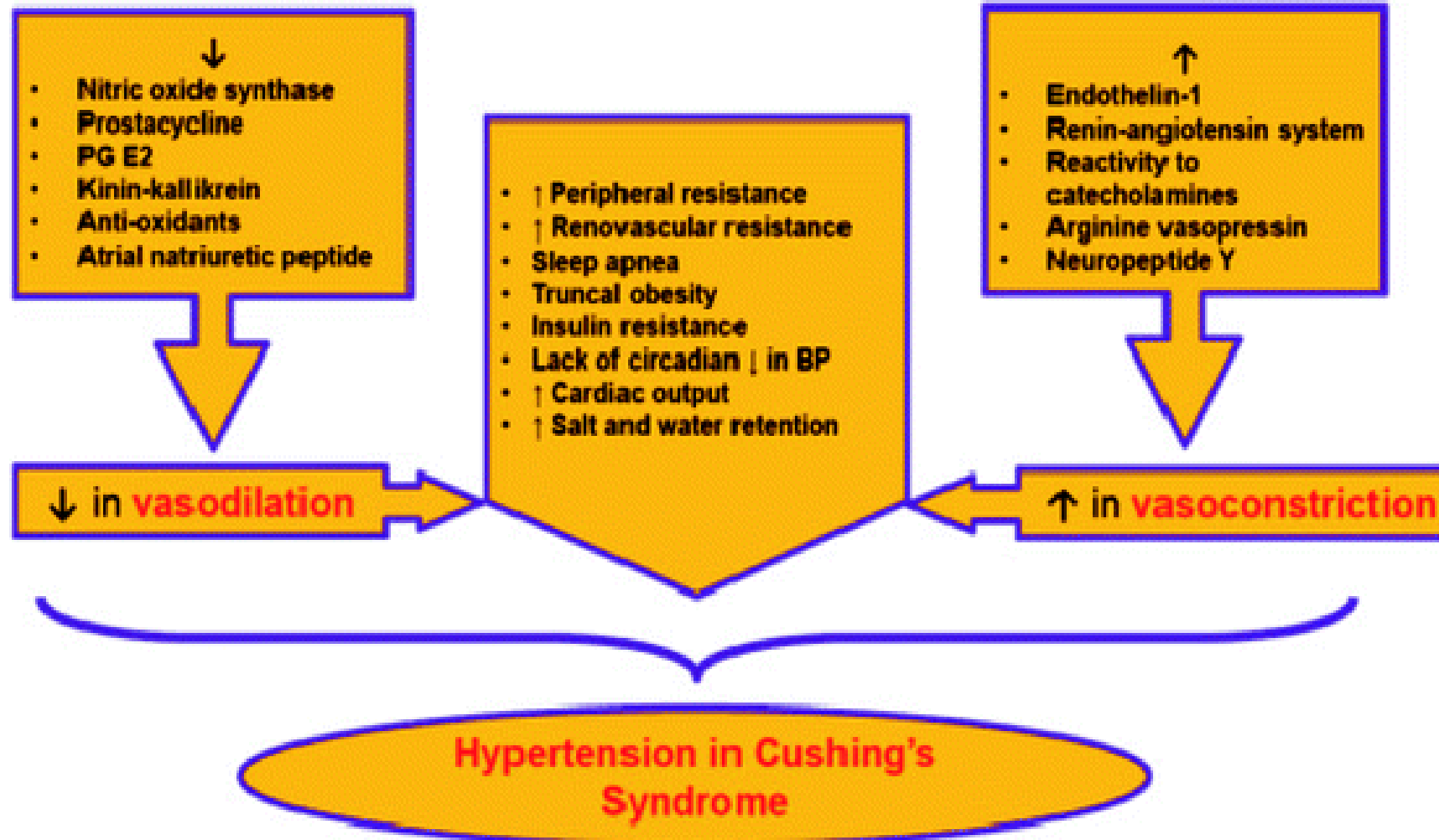


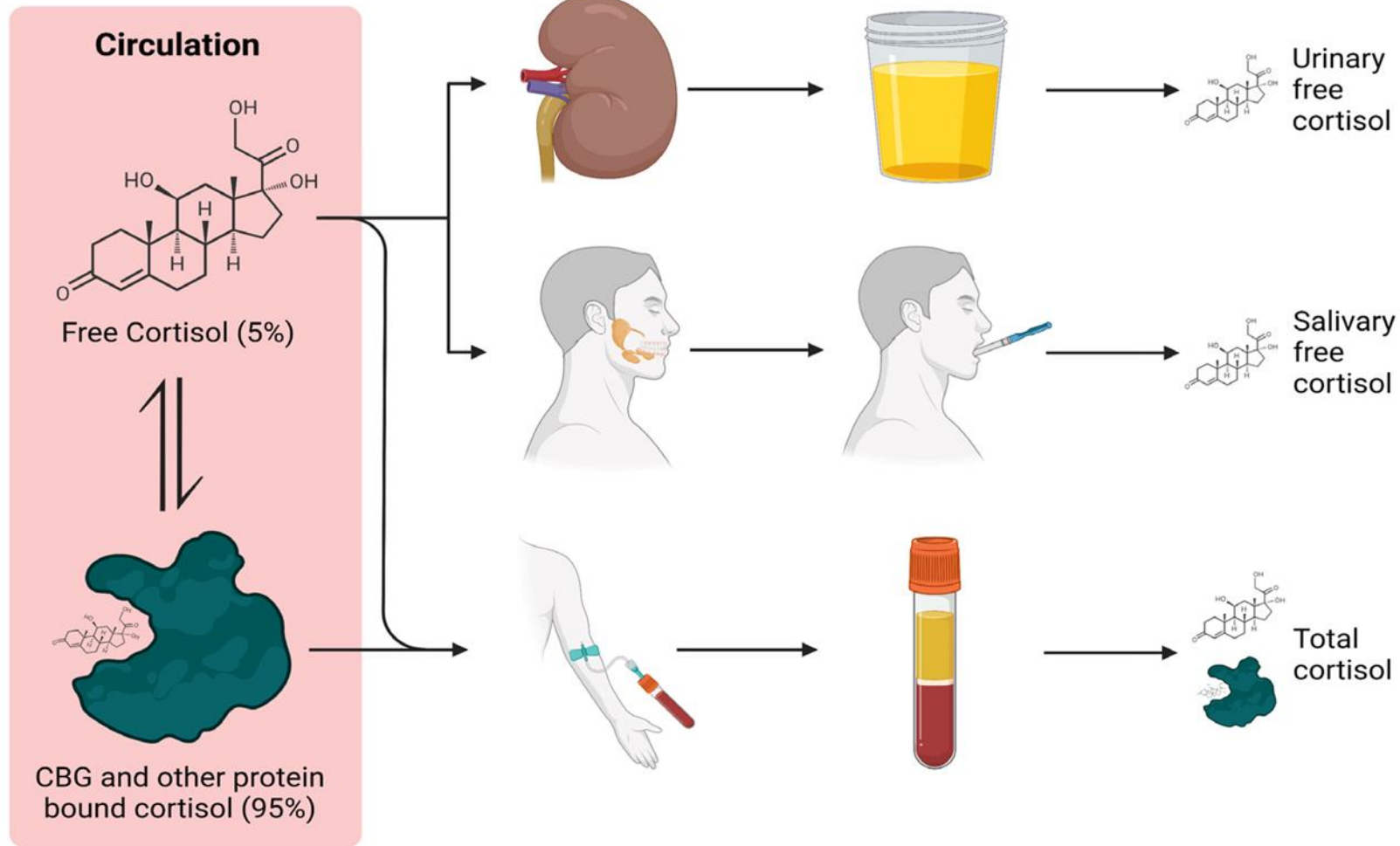
It is not recommended to screen patients if they present general signs alone as obesity or type 2 diabetes because of the rarity of the disease and the cost of the diagnosis.





Disruption in the physiologic balance between mechanisms that regulate normal blood pressure





PRESS RELEASE

Meetings & Events

Endocrine Society guideline calls for increased screening for common cause of high blood pressure

Washington, DC | July 14, 2025





فشار خون ثانویه شایع‌تر از تصور است.

اشتباهات رایج در تشخیص آلدسترون‌یسم اولیه شامل تصور نادرست از نادر بودن بیماری، تأکید بیش از حد بر هیپوکالمی و تفسیر اشتباه آزمایش‌هاست.

آلدسترون‌یسم اولیه، فنوکروموسیتوما و کوشینگ از علل مهم و قابل درمان هستند.

غربالگری به موقع و آگاهی از شرایط بالینی، کلید تشخیص صحیح است



