

Tips and tricks in hypertension

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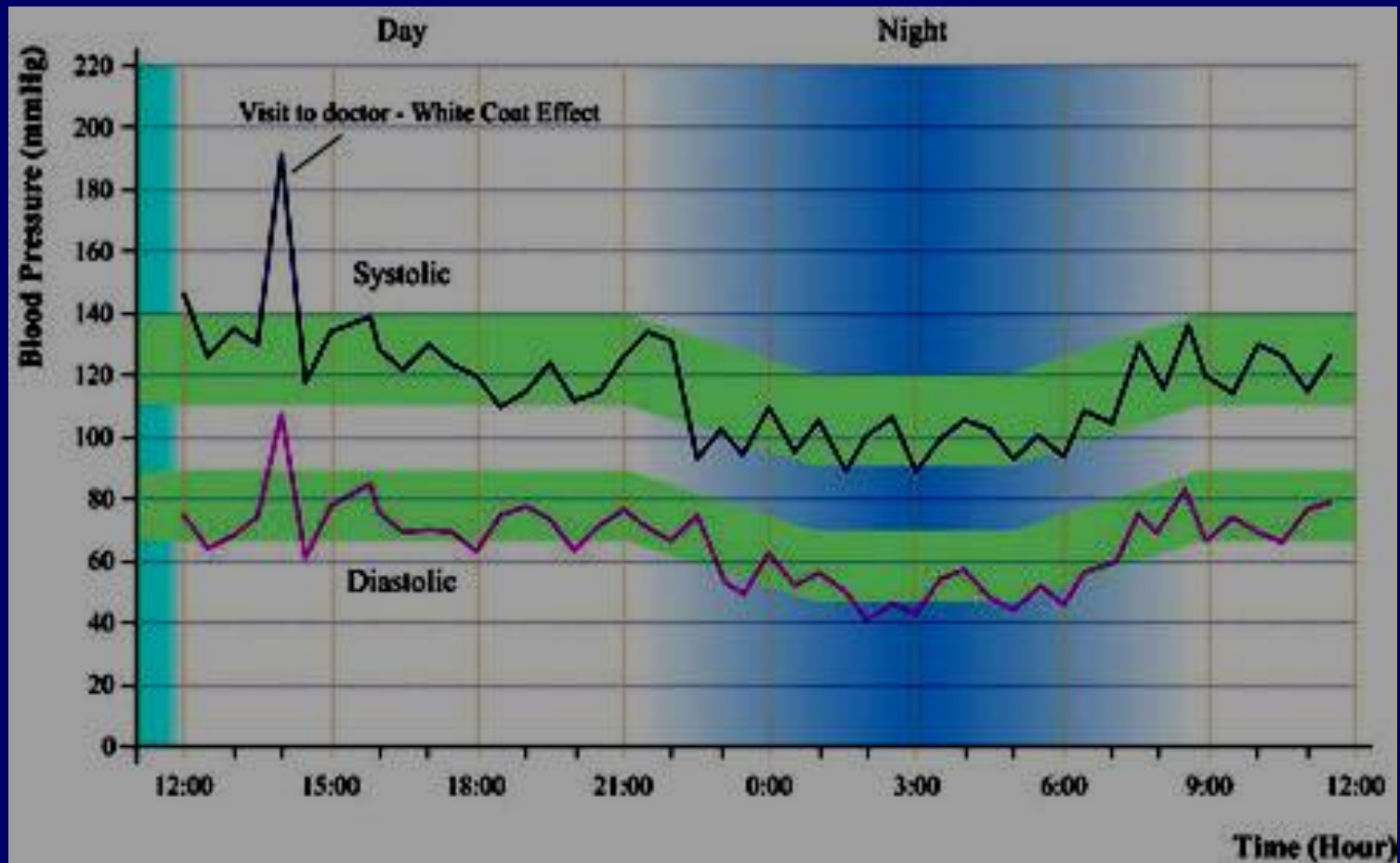
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Commonly asked questions in hypertension

What is the best approach to the patient with presumed white-coat hypertension ?

White coat hypertension



White coat hypertension

White coat hypertension is best diagnosed with ambulatory blood pressure monitoring or based on normal home readings. It represents about 30% of those patients with resistant hypertension. Sympathetically driven forms of hypertension have a white coat component and are best treated with intermittent oral clonidine, transdermal clonidine, and/or guanfacine. Reserpine is an excellent drug for these patients but is currently not available.

Commonly asked questions in hypertension

Are there common principles applied to the management of the complex hypertensive ?

Principles of Multi-Drug Antihypertensive Therapy

- Utilize split dosing
- Do not employ excessive dose titration
- Control volume status and any medication-induced pulse-rate change
- Utilize complementary medications
- Employ medications for co-morbid conditions that may also double as anti-hypertensives

Commonly asked questions in hypertension

What are some of the more common yet unusual combinations that are used in the treatment of the patient with difficult-to-treat hypertension ?

Antihypertensive Regimens of Note

Caveats

Control for volume, pulse-rate, RAAS and SNS activation

Combinations

Minoxidil, β -blocker (or combined α - β - blocker), diuretic, and ACE inhibitor (or ARB)

ACE inhibitor (or ARB), diuretic, CCB, and **peripheral α -blocker** or **spironolactone**

ACE inhibitor (or ARB), **non-dihydropyridine CCB** and **dihydropyridine CCB**, with or without a diuretic

ACE inhibitor (or ARB), diuretic, CCB, and **transdermal clonidine**

Ancillary treatment measures

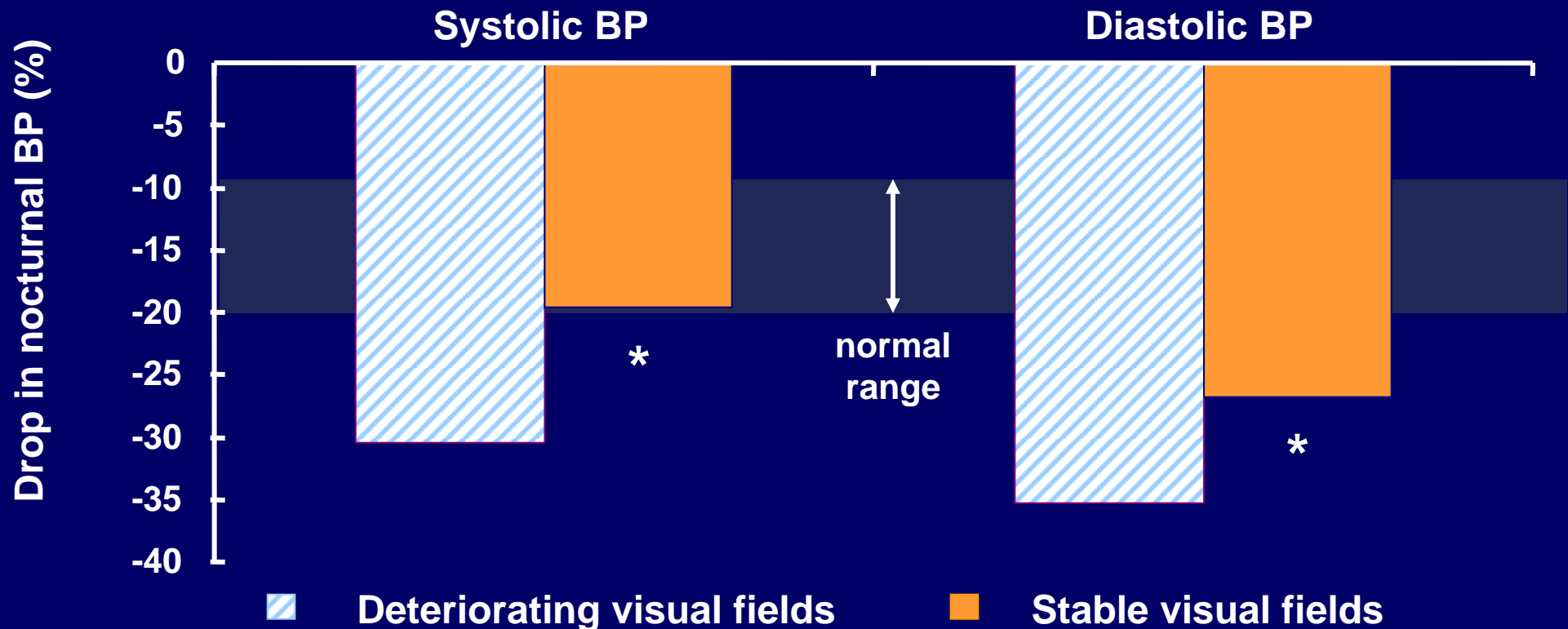
Sleep, anxiety, panic disorder, depression, alcohol intake, smoking, weight control and avoidance of medications associated with increases in blood pressure

Commonly asked questions in hypertension

My patient recently described temporary loss of his vision when awakening in the middle of the night to void.

Can this be related to his blood pressure ?

Nocturnal BP Change and Anterior Ischemic Optic Neuropathy



*P<0.05

Visual change in a patient being treated for hypertension

A variety of systems can be underperfused if blood pressure values are too low at night, particularly the eyes; accordingly, if nighttime dosing of medications are considered either with once daily dosing and/or as a component of twice daily dosing one must be certain that the blood pressure is not normal at bedtime lest significant hypotension occurs during sleep.

Hypertensive Urgency

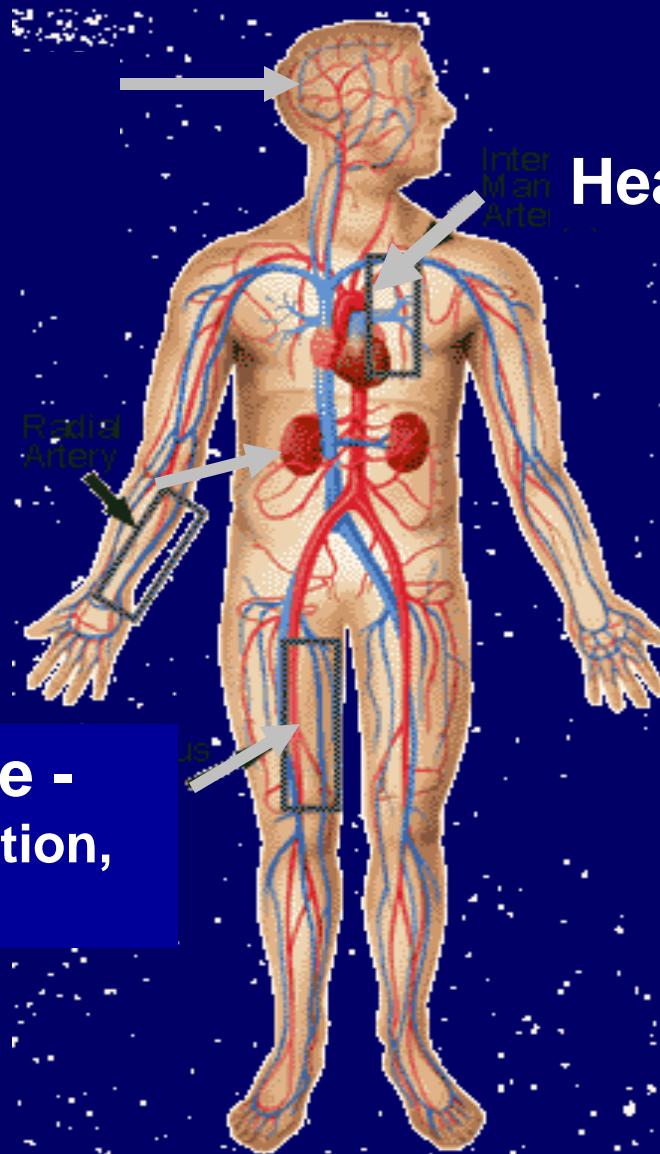
- Severely elevated blood pressure *without* signs and symptoms of acute end organ damage
- Can be managed as an *outpatient*
- Can be managed *with oral medications*

Hypertensive Emergency

CNS - encephalopathy,
intracranial hemorrhage,
Grade 3-4 retinopathy

Kidneys - acute kidney
injury, microscopic
hematuria

Vasculature -
aortic dissection,
eclampsia

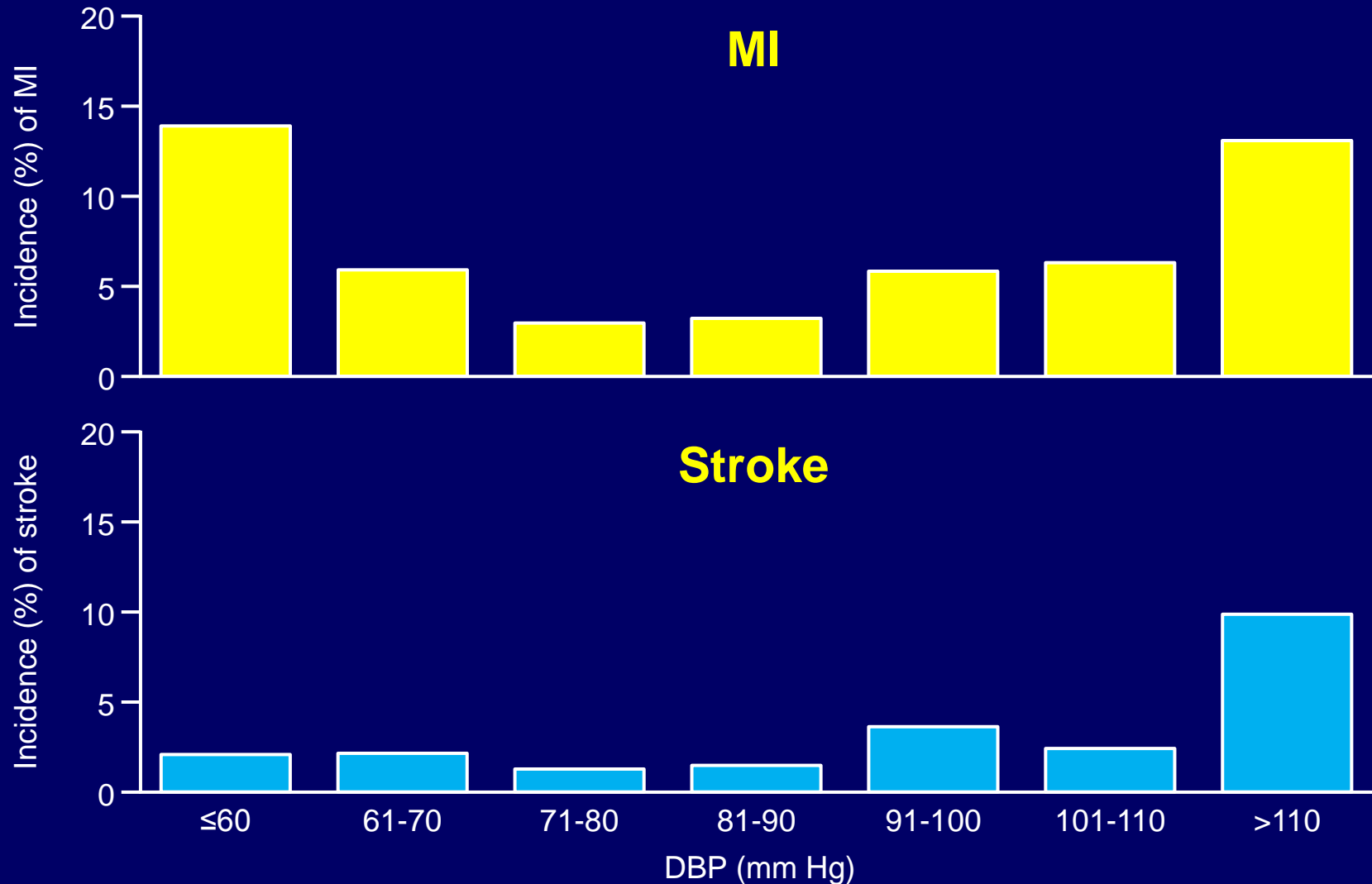


Heart - CHF, MI, angina

Is There a “J” Curve for Increased CV Events Associated with ISH?



Incidence of MI and Stroke Stratified by Diastolic Blood Pressure in the INVEST Study

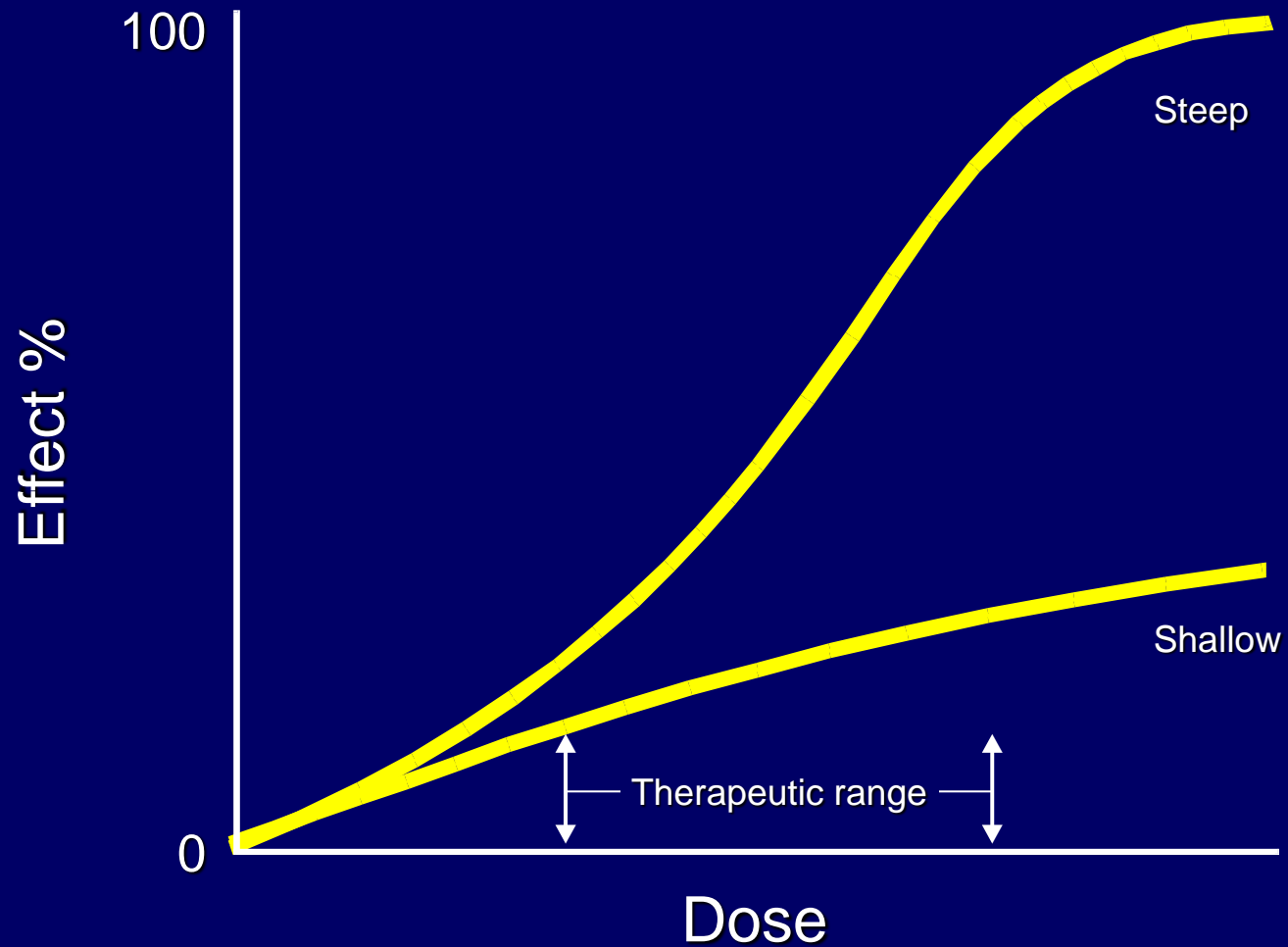


Commonly asked questions in hypertension

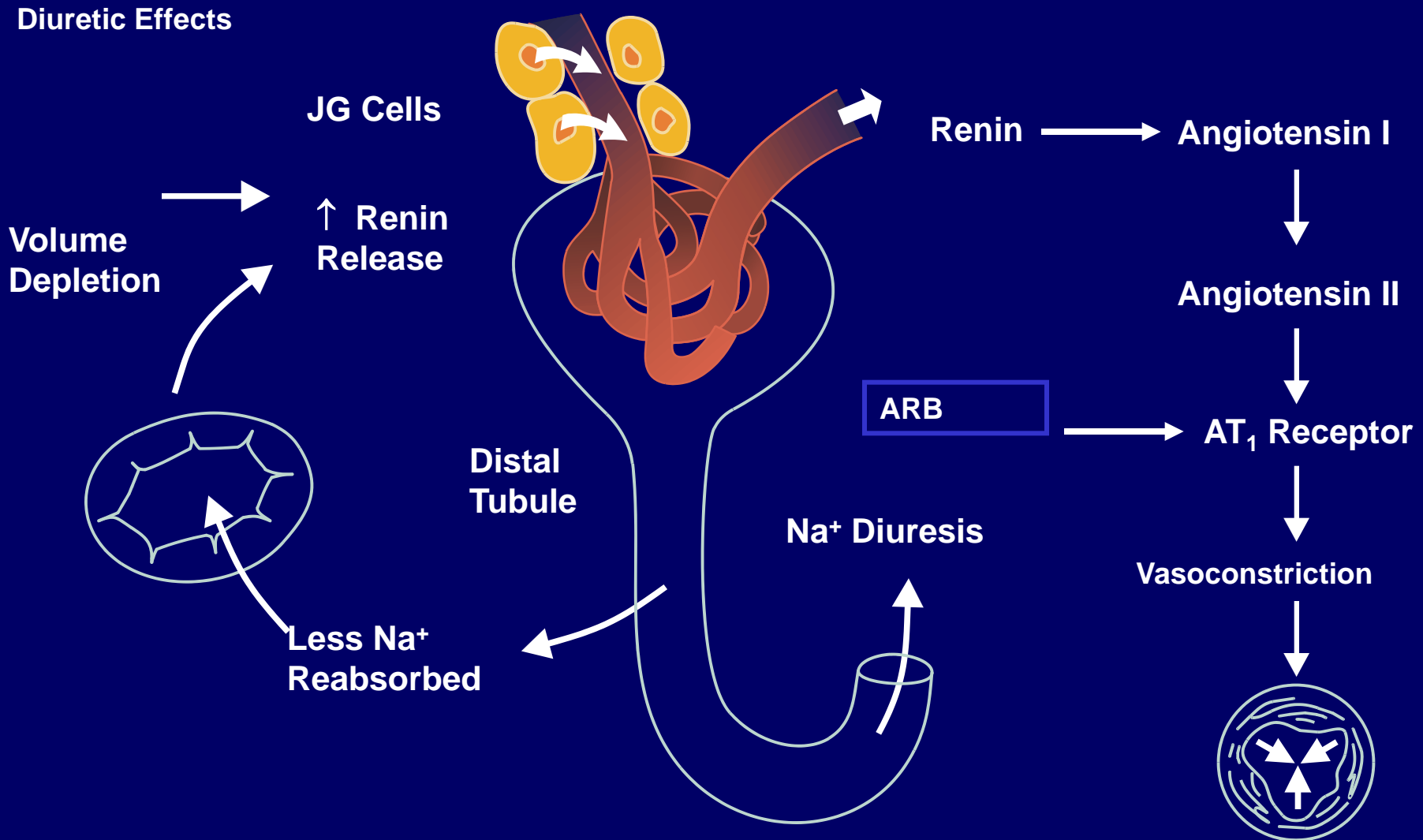
My patient is taking hydrochlorothiazide and an angiotensin-receptor blocker and their blood pressure is still not at goal.

Is the best approach to add a third drug class?

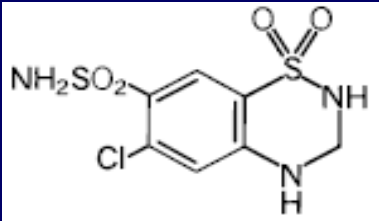
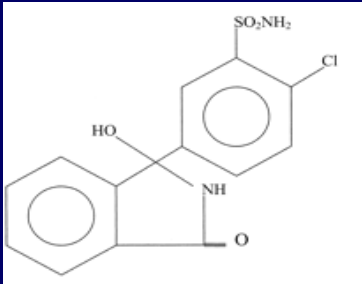
Therapeutic Considerations in the Dose-Response Relationship



Rationale for Combination of ARBs or ACE inhibitors With Diuretics



Pharmacokinetic/Pharmacodynamic Comparison of HCTZ and Chlorthalidone

	<i>Onset (h)</i>	<i>Peak (h)</i>	<i>Half-life (h)</i>	<i>Duration (h)</i>
<p>HCTZ</p> 	2	4-6	6-9 (single dose) 8-15 (long-term dosing)	12 (single dose) 16-24 (long-term dosing)
<p>Chlorthalidone</p> 	2-3	2-6	40 (single dose) 45-60 (long-term dosing)	24-48 (single dose) 48-72 (long-term dosing)

Need for a third drug class in a patient not at goal blood pressure

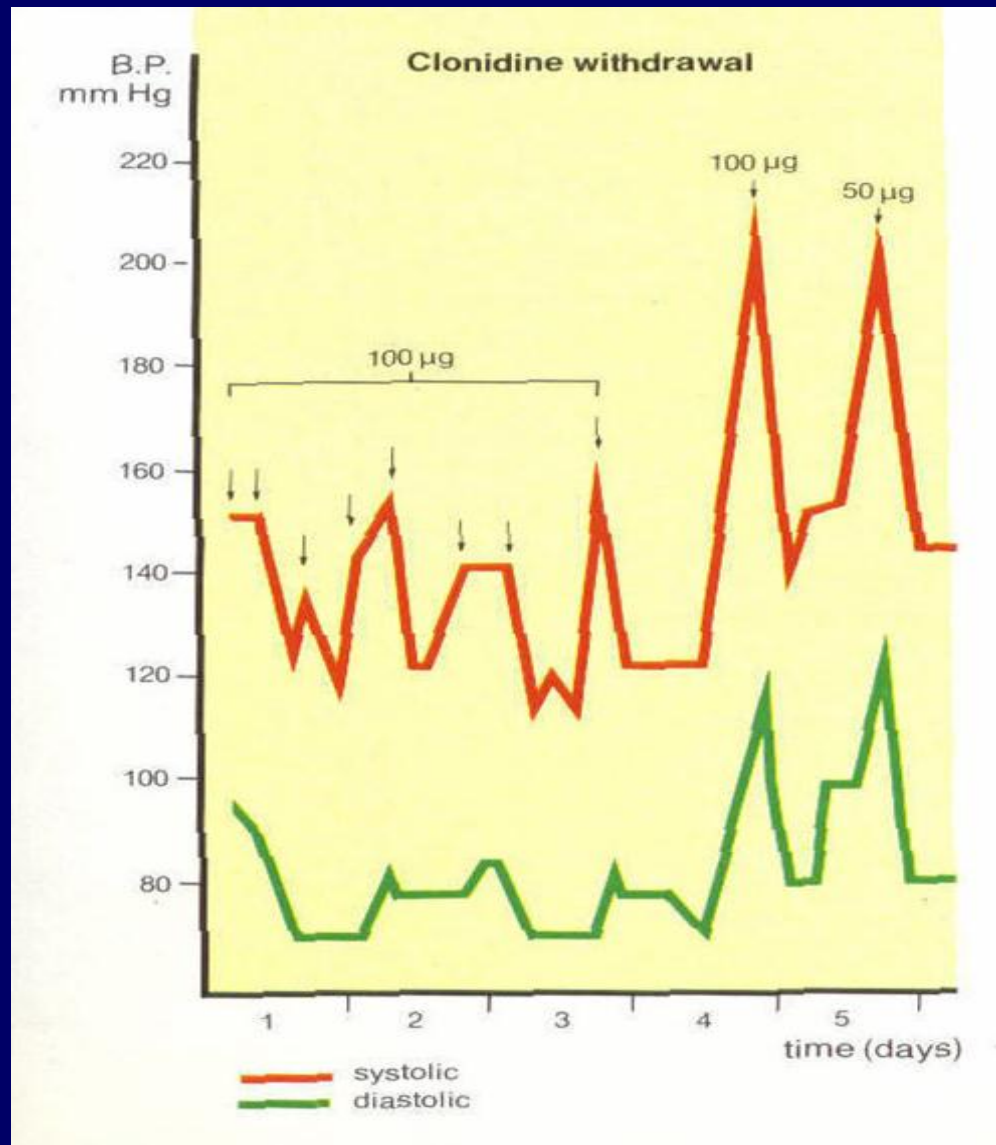
Diuretic therapy is additive to the effect of an angiotensin-receptor blocker in lowering blood pressure dependent on the level of volume change resulting from the diuretic. If one converts from hydrochlorothiazide to a long-acting thiazide diuretic, such as chlorthalidone, an additional reduction in blood pressure can occur and the need for a third medication often eliminated.

Commonly asked questions in hypertension

My patient is taking clonidine twice a day for blood pressure spikes and these spikes seem to be occurring more regularly.

What can be done to lessen the blood pressure spikes ?

Medication withdrawal and hypertension



Clonidine use in a patient with spiking blood pressures

Clonidine is a useful therapy for patients prone to episodic increases in blood pressure; however, a subset of patients will experience rebound hypertension hours after its use, particularly in those on beta-blockers. The most important consideration is to recognize this and consider use of more long-acting therapies, such as transdermal clonidine and/or alpha-methyldopa.

Commonly asked questions in hypertension

My patient developed clear-cut angioedema with an ACE inhibitor and has heart failure and chronic kidney disease.

Can I safely start an angiotensin-receptor blocker ?

ACE inhibitor related glossomegaly



Figure

ARB use in a patient with ACE inhibitor related angioedema

- There is a small degree of cross-reactivity in the order of 5% for the development of angioedema with an angiotensin-receptor blocker when given with such a patient. The patient should be advised as to the possibility of angioedema and documentation occur in the chart as to the basis for the need to use an angiotensin receptor blocker.

Angioedema of the intestine



- ACE inhibitor angioedema of the intestine is more common in females
- This diagnosis should be considered in any patient presenting with unexplained abdominal pain while on an ACE inhibitor
- Angioedema of the intestine is reversible within 48 hrs of cessation of the medication.

Commonly asked questions in hypertension

My patient has difficult-to-control hypertension and has responded to a calcium channel blocker; however she always develops peripheral edema.

Can this problem be solved ?

Calcium-channel blocker related peripheral edema



Source: Sirker A et al. *J Hum Hypertens*. 2001; 15:745-746.

Peripheral edema in a calcium channel blocker treated patient

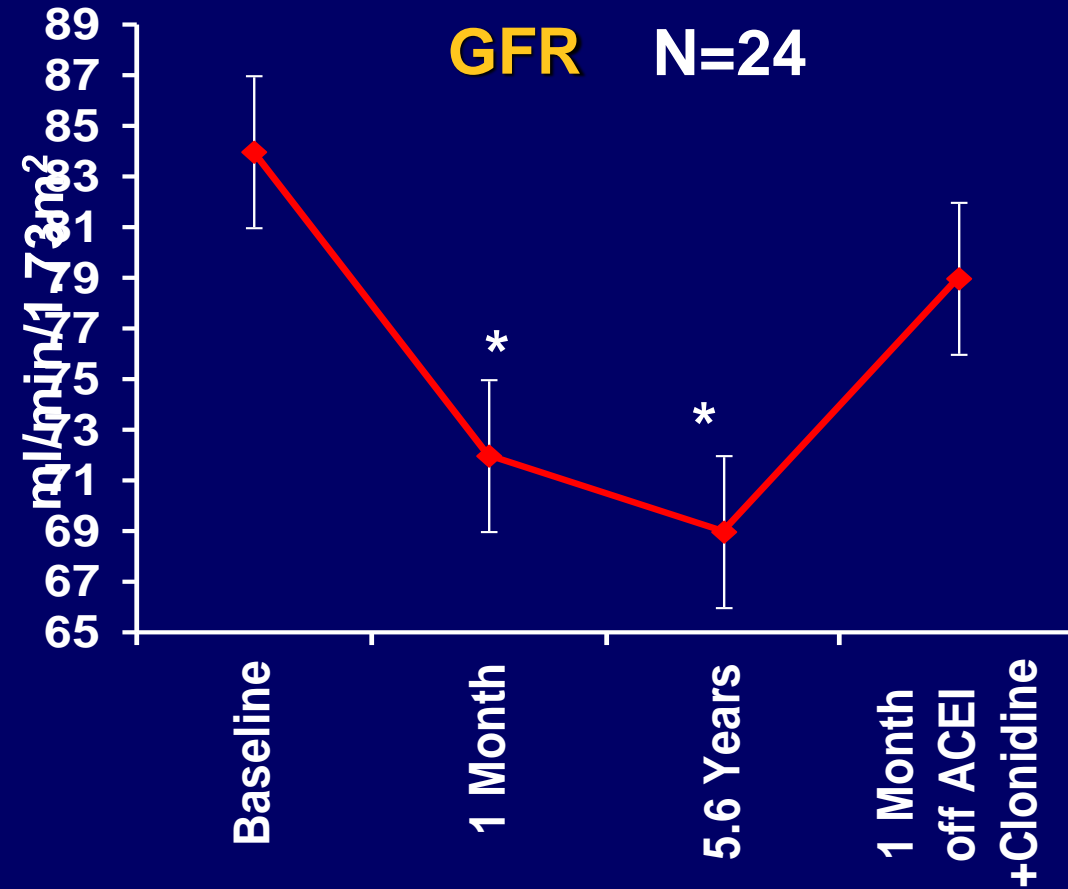
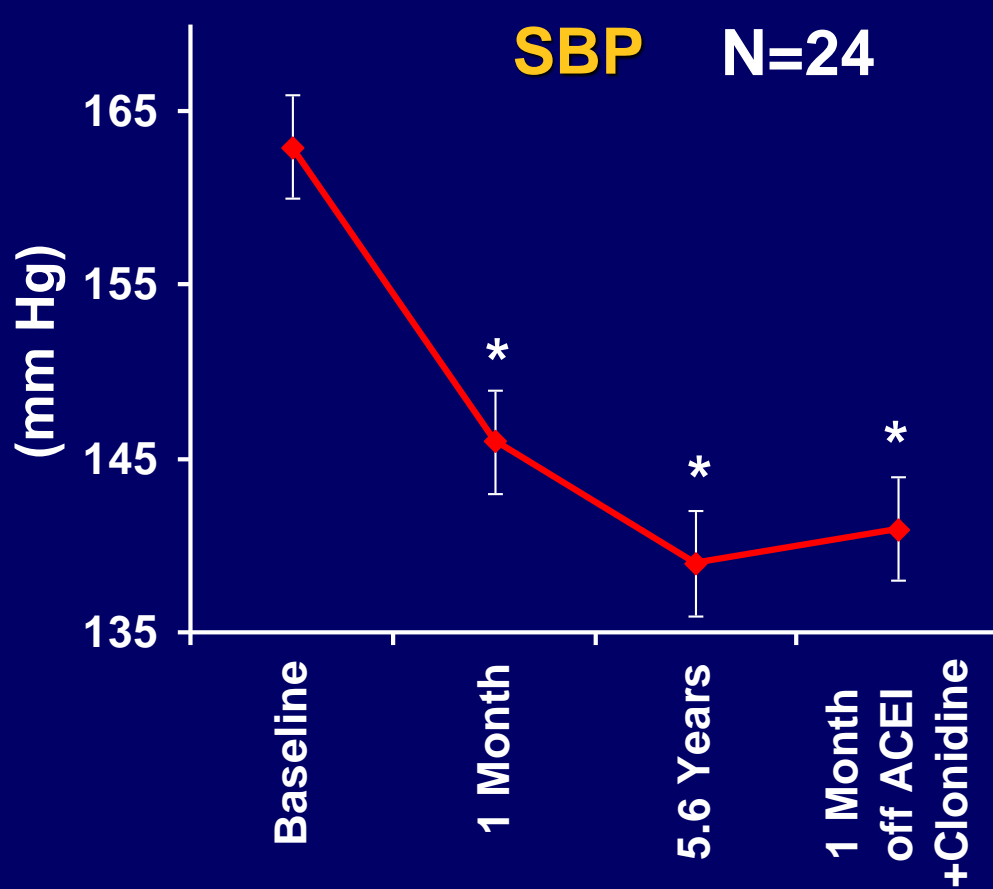
Peripheral edema is not uncommon with a calcium channel blocker, particularly in women. It is not related to fluid retention, rather it is positional, thus diuretic therapy does not treat it. Calcium channel blockers are arterial and not venodilators. The edema can be treated by concurrent treatment with a venodilator such as isosorbide dinitrate and/or an ACE inhibitor or ARB. Calcium channel blocker edema also is less so with lower medication doses and when taken at bedtime.

Commonly asked questions in hypertension

My patient is taking an ACE inhibitor and their serum creatinine went up from 1.3 to 1.8-mg/dL.

Do I need to permanently stop the ACE inhibitor ?

Impact of ACE Inhibition on Blood Pressure and GFR: Acute vs Chronic Effects



* $P < 0.05$ compared to baseline

Increase in serum creatinine with an ACE inhibitor

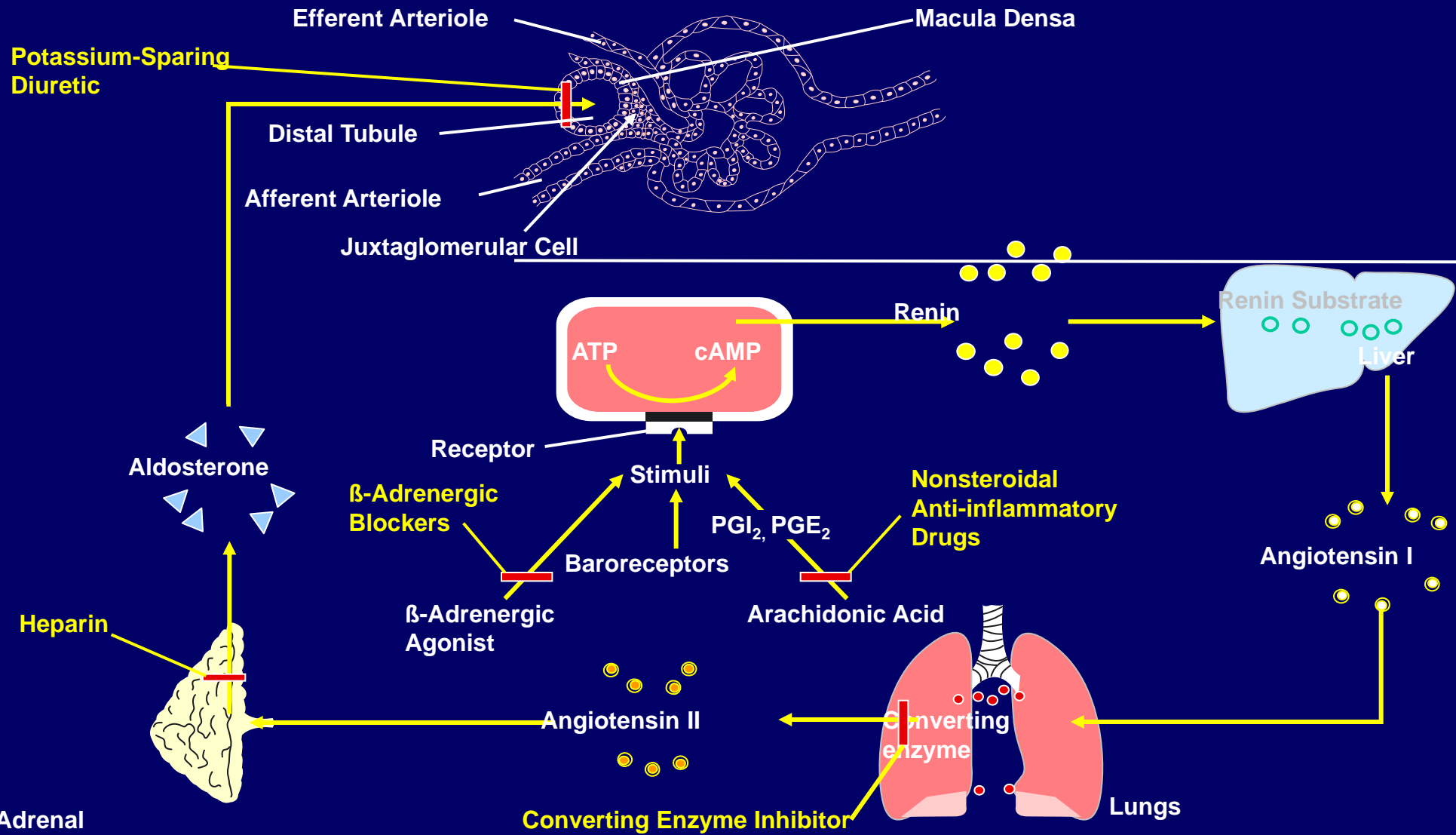
Small increases in serum creatinine, in the order of 0.1 to 0.3-mg/dL are common with an ACE inhibitor that correcting with stopping the drug. Increases > 0.3-mg/dL typically reflect underlying renal micro or macrovascular disease and/or volume contraction. A best approach is to normalize volume, which can occur with adjustment of the diuretic dose, temporarily holding the ACE inhibitor, and when restarting therapy using a lower dose and monitoring for recurrence in the “bump” in serum creatinine.

Commonly asked questions in hypertension

My patient is taking spironolactone and their blood pressure is well-controlled; however, the serum potassium value is up to 5.8-mmol/L

Can I still use the spironolactone ?

Mechanisms of Drug-induced Hyperkalemia



Increase in serum potassium with spironolactone

Hyperkalemia can occur with spironolactone. Treatment steps that can be taken to still allow some spironolactone dose include dietary potassium restriction, using the lowest dose possible with such a low dose occasionally being 12.5-mg every other day, and/or using a long-acting diuretic to promote kaliuresis, while avoiding other drugs that increase serum potassium such as Bactrim, NSAIDs and ACE inhibitors.