

## CALCIUM CHANNEL BLOCKERS

*Amlodipine* NORVASC

*Clevidipine* CLEVIPREX

*Diltiazem* CARDIZEM, CARTIA, DILACOR

*Felodipine* PLENDIL

*Isradipine* DYNACIRC CR

*Nicardipine* CARDENE

*Nifedipine* ADALAT, NIFEDIAC, PROCARDIA

*Nisoldipine* SULAR

*Verapamil* CALAN, ISOPTIN, VERELAN

## $\alpha$ -BLOCKERS

*Doxazosin* CARDURA

*Prazosin* MINIPRESS

*Terazosin* HYTRIN

## OTHERS

*Clonidine* CATAPRES, DURACLON

*Fenoldopam* CORLOPAM

*Hydralazine* APRESOLINE

*Methyldopa* ALDOMET

*Minoxidil* LONITEN

*Nitroprusside* NITROPRESS

## DIURETICS

*Amiloride* MIDAMOR

*Bumetanide* BUMEX

*Chlorthalidone* HYGROTON

*Eplerenone* INSPRA

*Ethacrynic acid* EDECRIN

*Furosemide* LASIX

*Hydrochlorothiazide* MICROZIDE

*Indapamide* LOZOL

*Metolazone* MYKROX, ZAROXOLYN

*Spiroinolactone* ALDACTONE

*Triamterene* DYRENIUM

*Torseamide* DEMADEx

## β-BLOCKERS

*Acebutolol* SECTRAL

*Atenolol* TENORMIN

*Betaxolol* KERLONE

*Bisoprolol* ZEBETA

*Carvedilol* COREG, COREG CR

*Esmolol* BREVIBLOC

*Labetalol* TRANDATE

*Metoprolol* LOPRESSOR, TOPROL-XL

*Nadolol* CORGARD

*Nebivolol* BYSTOLIC

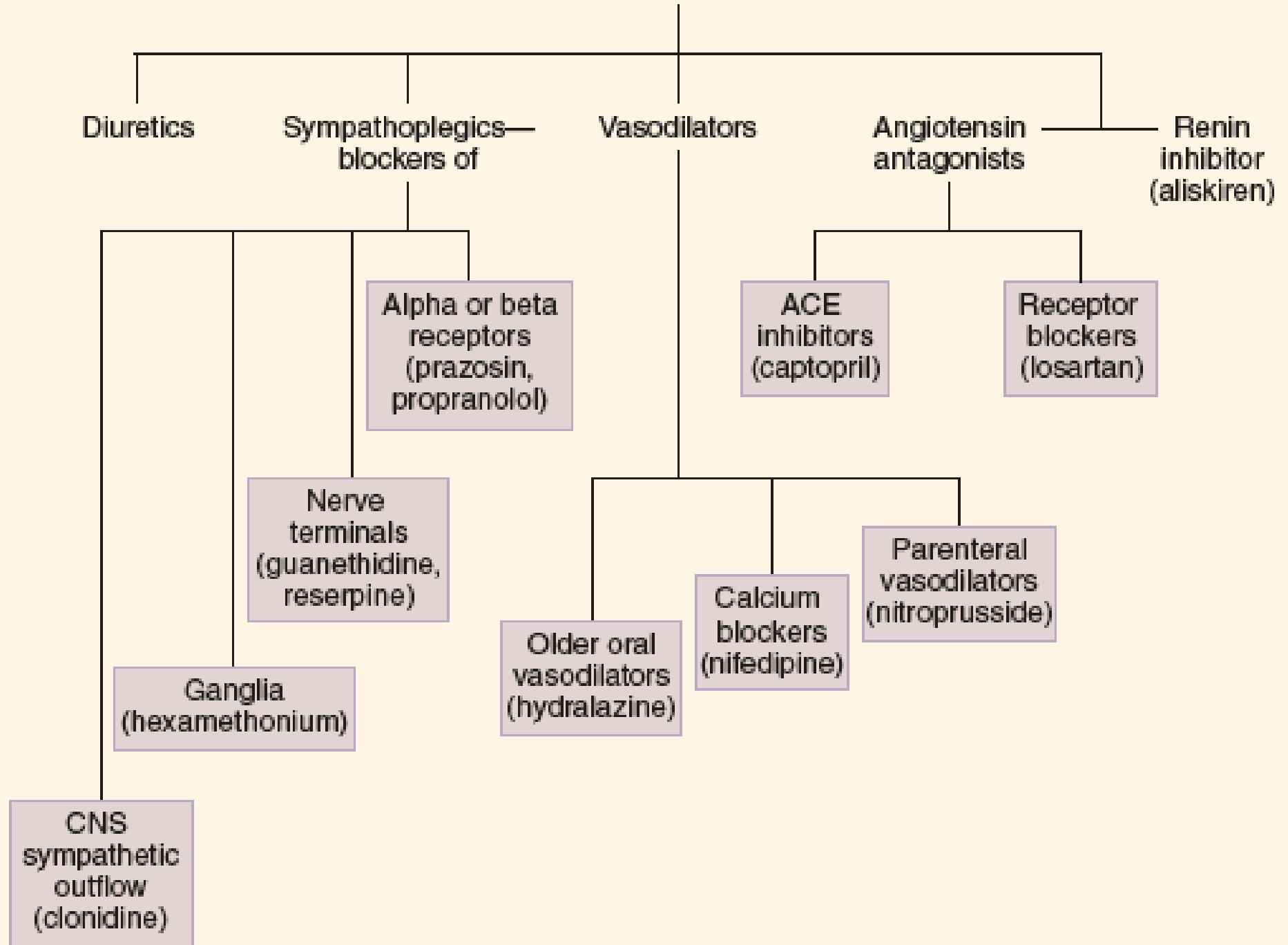
*Penbutolol* LEVATOL

*Pindolol* VISKEN

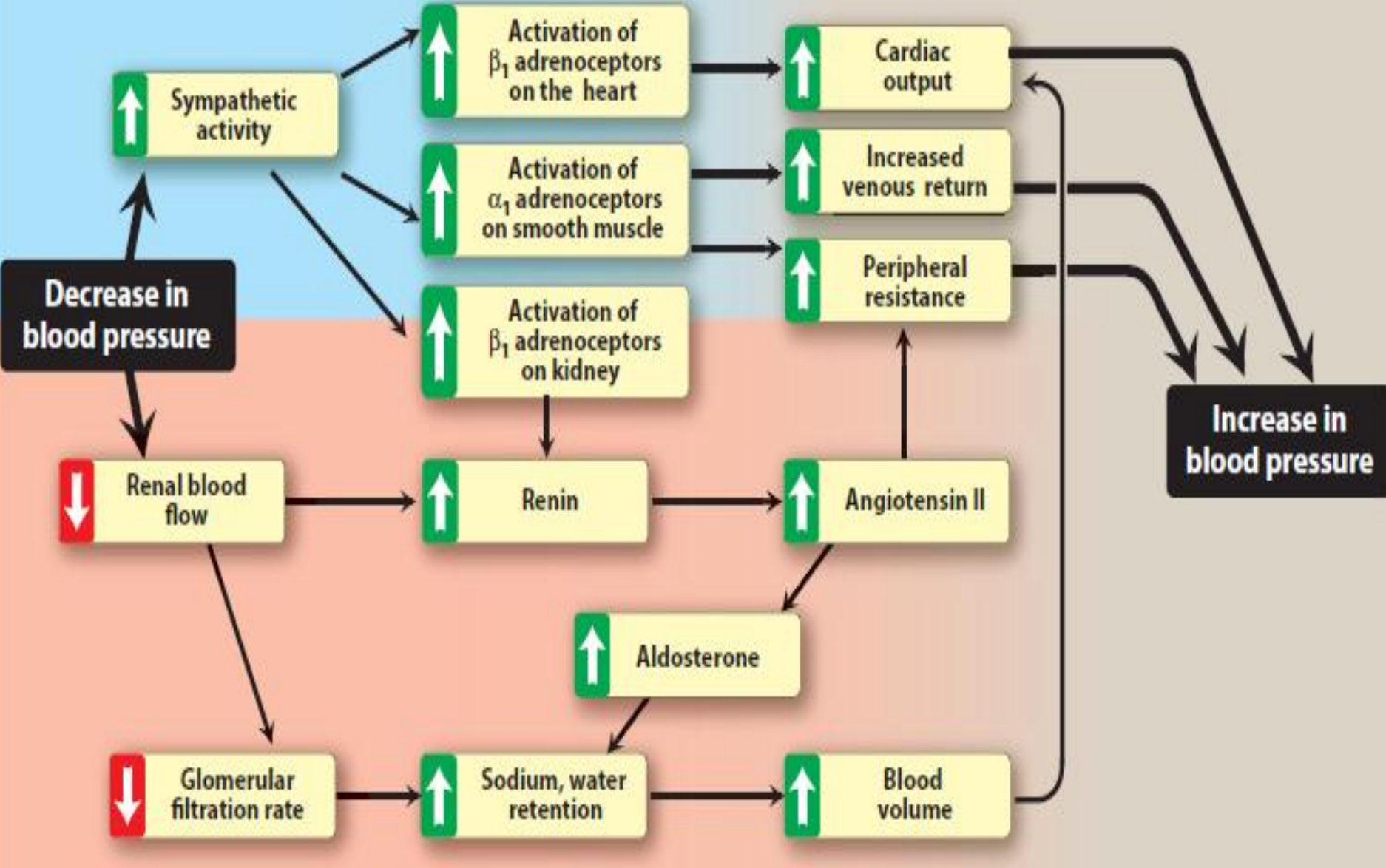
*Propranolol* INDERAL LA, INNOPRAN XL

*Timolol* BLOCADREN

# Drugs used in hypertension



# Response mediated by the sympathetic nervous system



# Response mediated by the renin-angiotensin-aldosterone system

Angiotensinogen

*Renin*

**Aliskiren**

Angiotensin I  
(inactive decapeptide)

Bradykinin  
(active vasodilator)

*Angiotensin-  
converting  
enzyme*

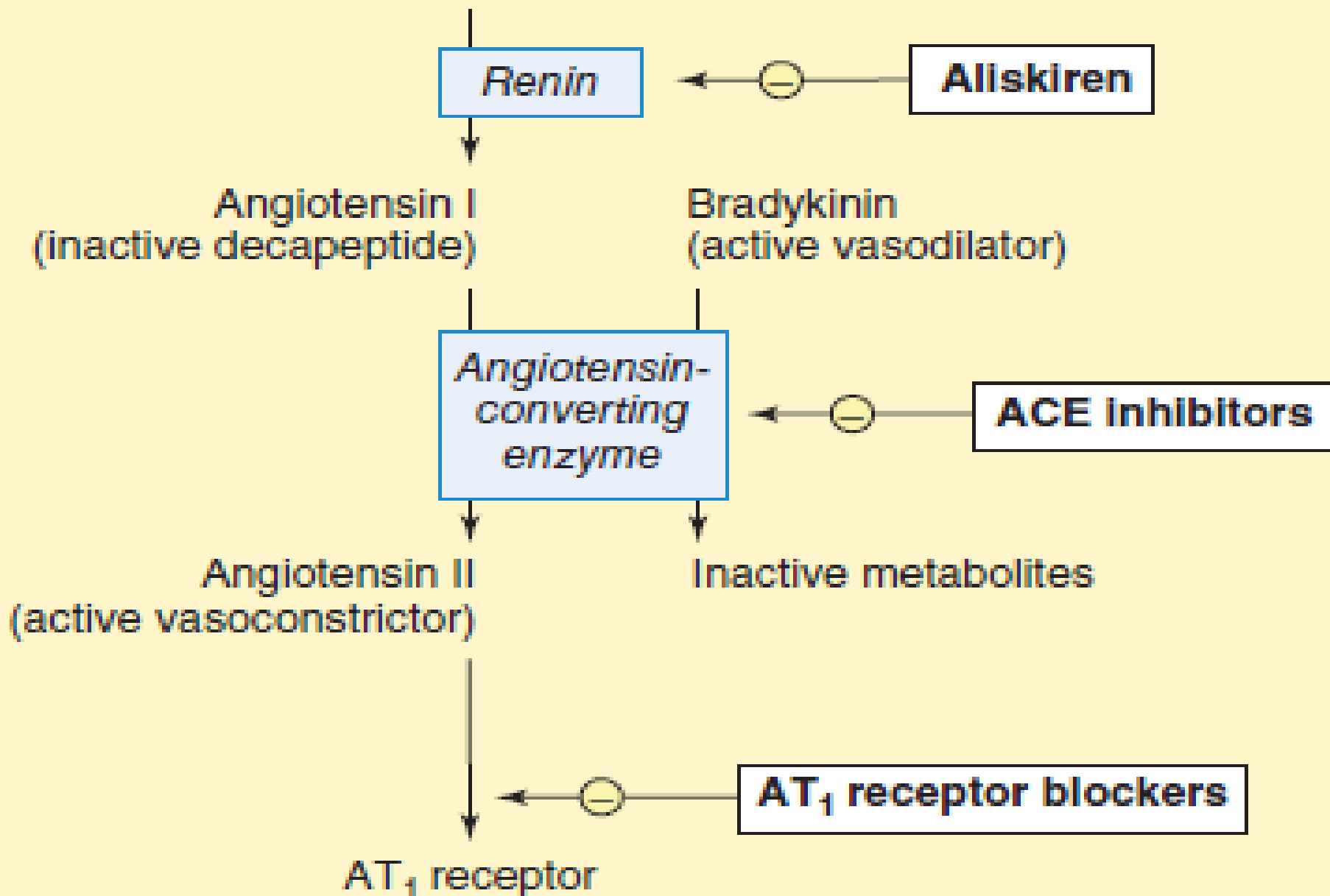
**ACE inhibitors**

Angiotensin II  
(active vasoconstrictor)

Inactive metabolites

**AT<sub>1</sub> receptor blockers**

AT<sub>1</sub> receptor



## CONCOMITANT DISEASE

## DRUG CLASSES INDICATED IN TREATING HYPERTENSION

HIGH CORONARY DISEASE RISK

Diuretics

$\beta$ -Blockers

ACE inhibitors

Ca<sup>2+</sup> channel blockers

DIABETES

Diuretics

ACE inhibitors

ARBs

Ca<sup>2+</sup> channel blockers

RECURRENT STROKE

Diuretics

ACE inhibitors

HEART FAILURE

Diuretics

$\beta$ -Blockers

ACE inhibitors

ARBs

Aldosterone-receptor antagonists

PREVIOUS MYOCARDIAL INFARCTION

$\beta$ -Blockers

ACE inhibitors

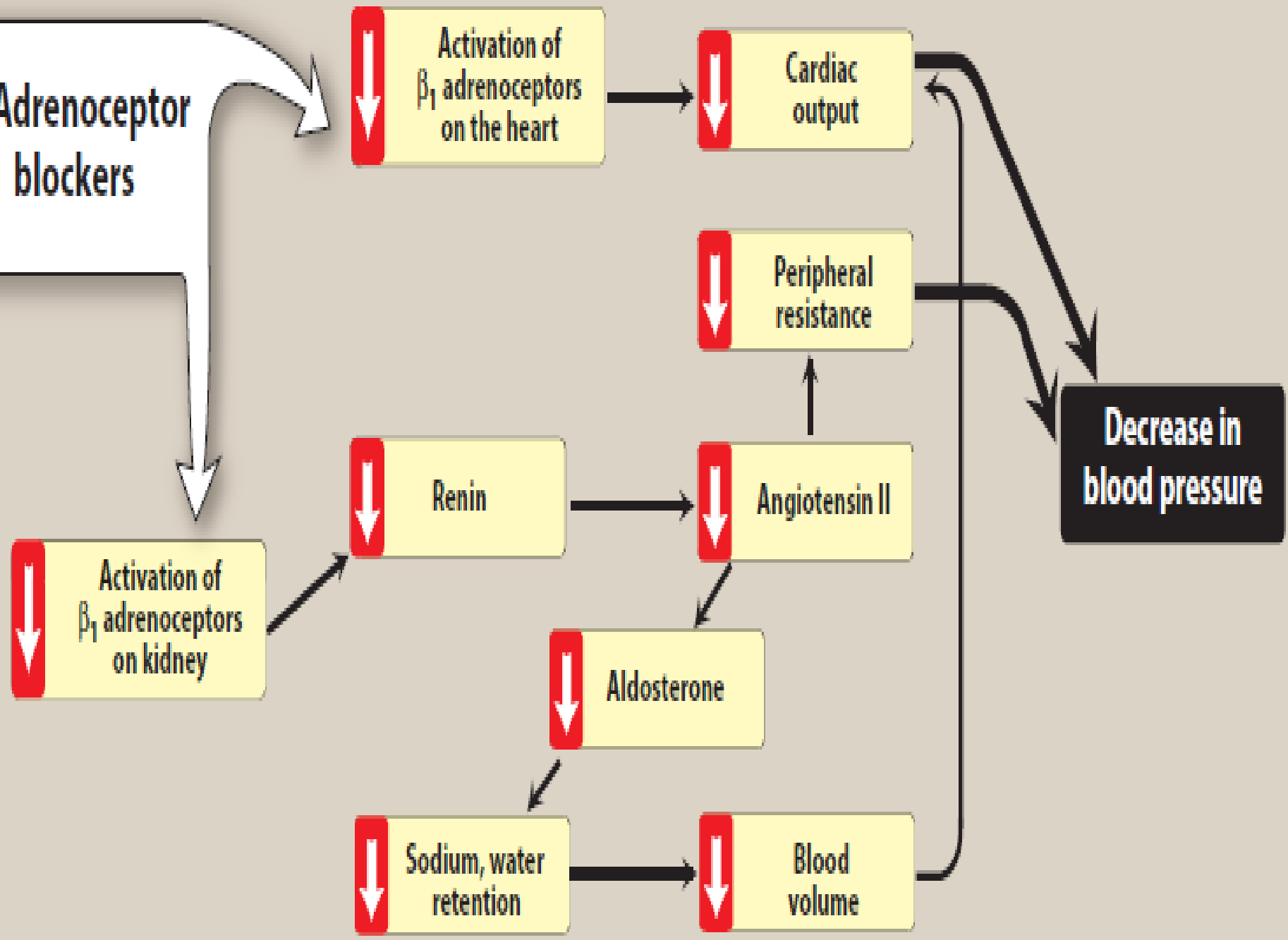
Aldosterone-receptor antagonists

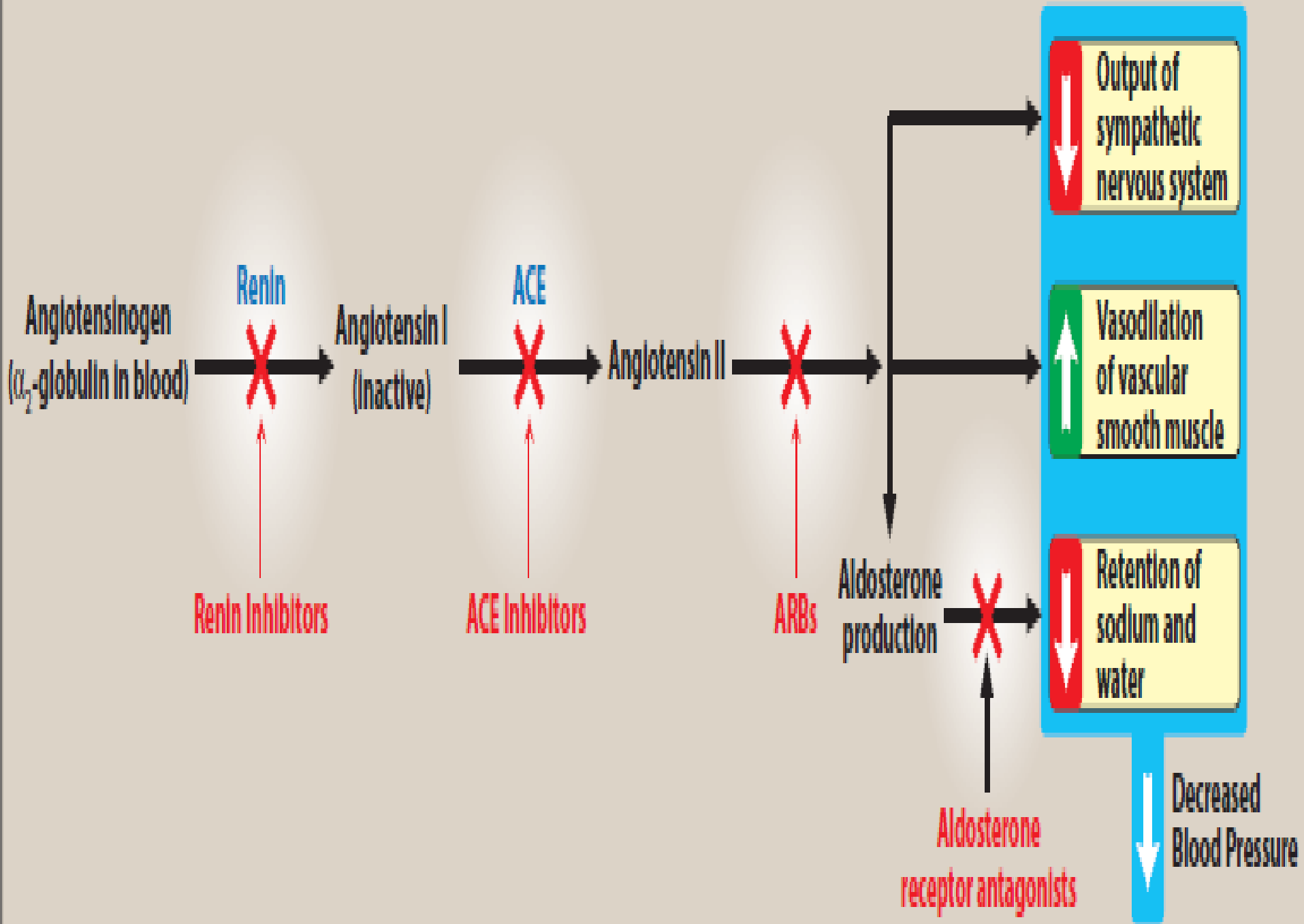
CHRONIC RENAL DISEASE

ACE inhibitors

ARBs

# $\beta$ -Adrenoceptor blockers





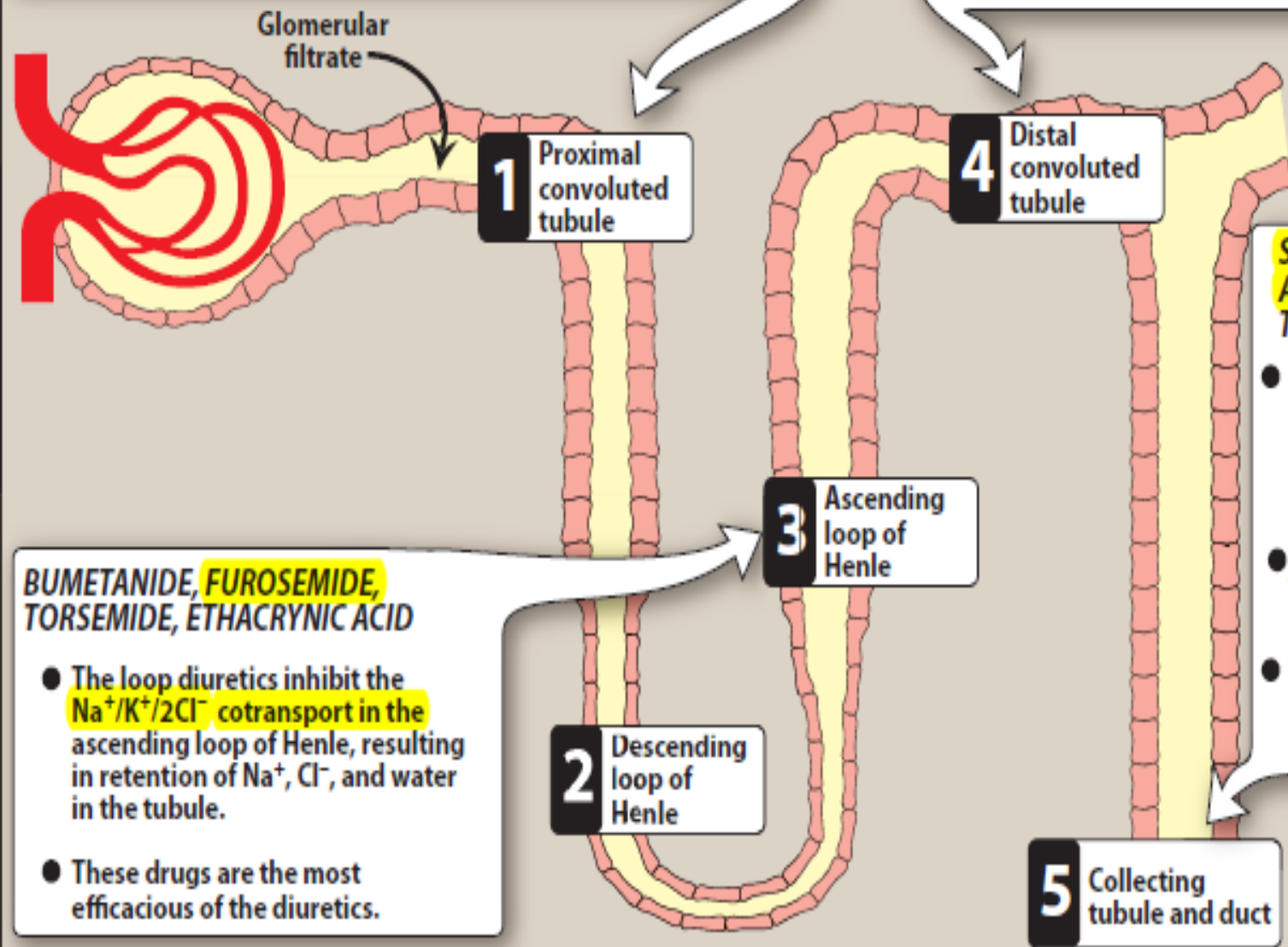


## ACETAZOLAMIDE

- A carbonic anhydrase inhibitor that inhibits the reabsorption of  $\text{HCO}_3^-$  in the proximal convoluted tubule.
- Weak diuretic properties.

## THIAZIDES AND THIAZIDE-LIKE

- Inhibit reabsorption of  $\text{Na}^+$  and  $\text{Cl}^-$  in the distal convoluted tubule, resulting in retention of water in the tubule.
- Most commonly used diuretic for the treatment of hypertension.



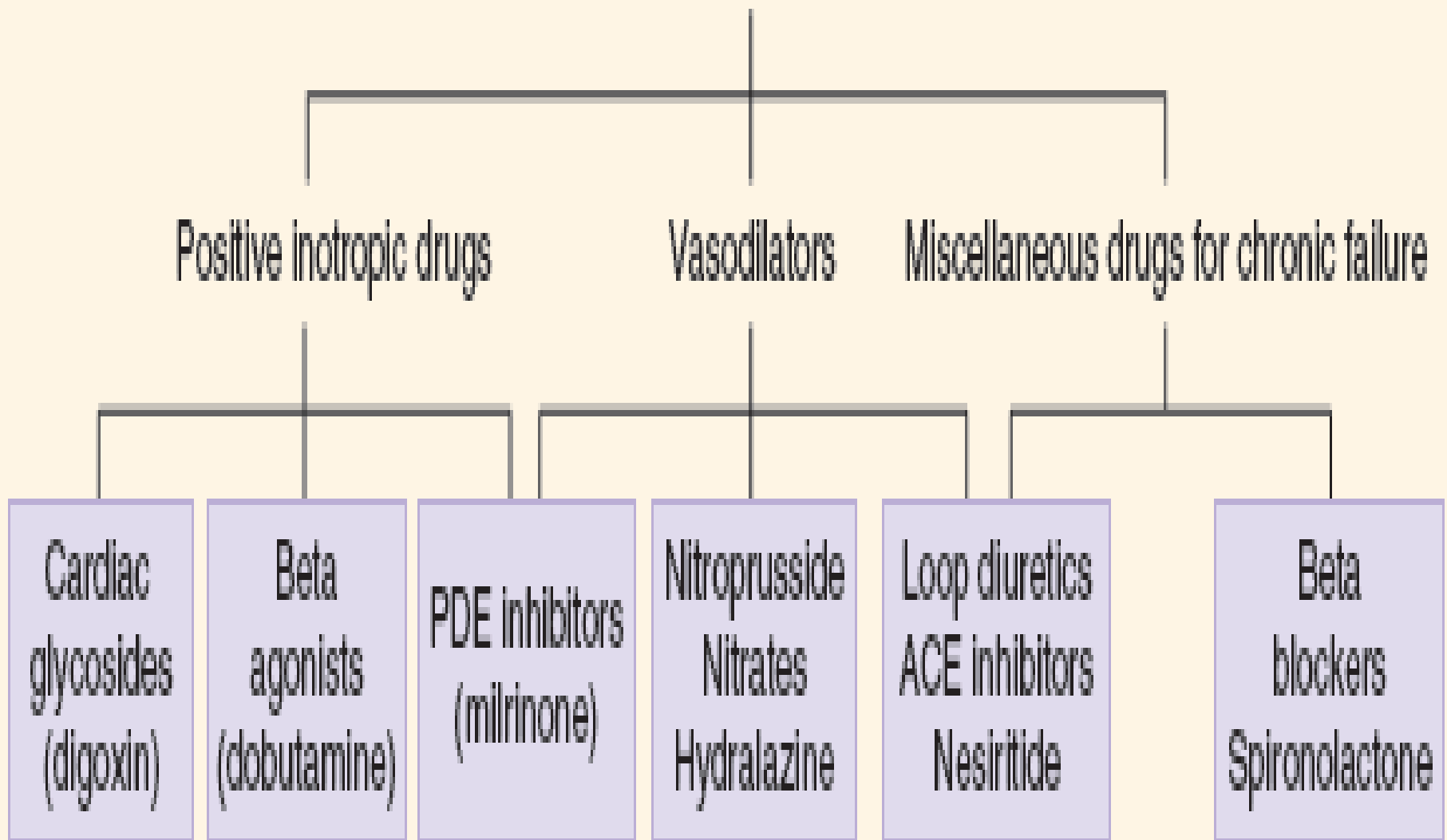
## SPIRONOLACTONE, AMILORIDE, TRIAMTERENE

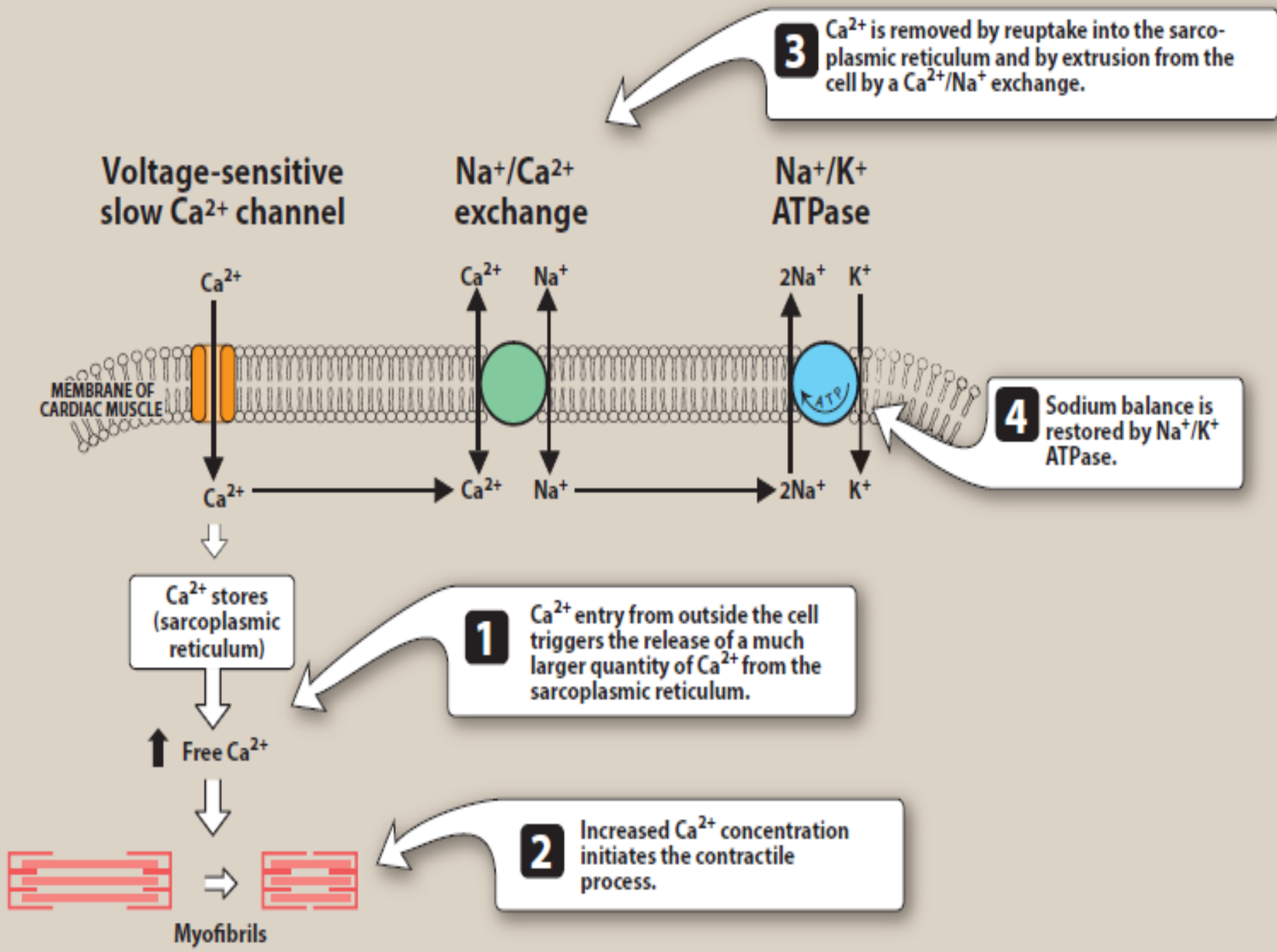
- *Spironolactone*, an aldosterone antagonist, inhibits the aldosterone-mediated reabsorption of  $\text{Na}^+$  and secretion of  $\text{K}^+$ .
- *Amiloride* and *triamterene* block  $\text{Na}^+$  channels.
- These agents can prevent loss of  $\text{K}^+$  that occurs with thiazide or loop diuretics.

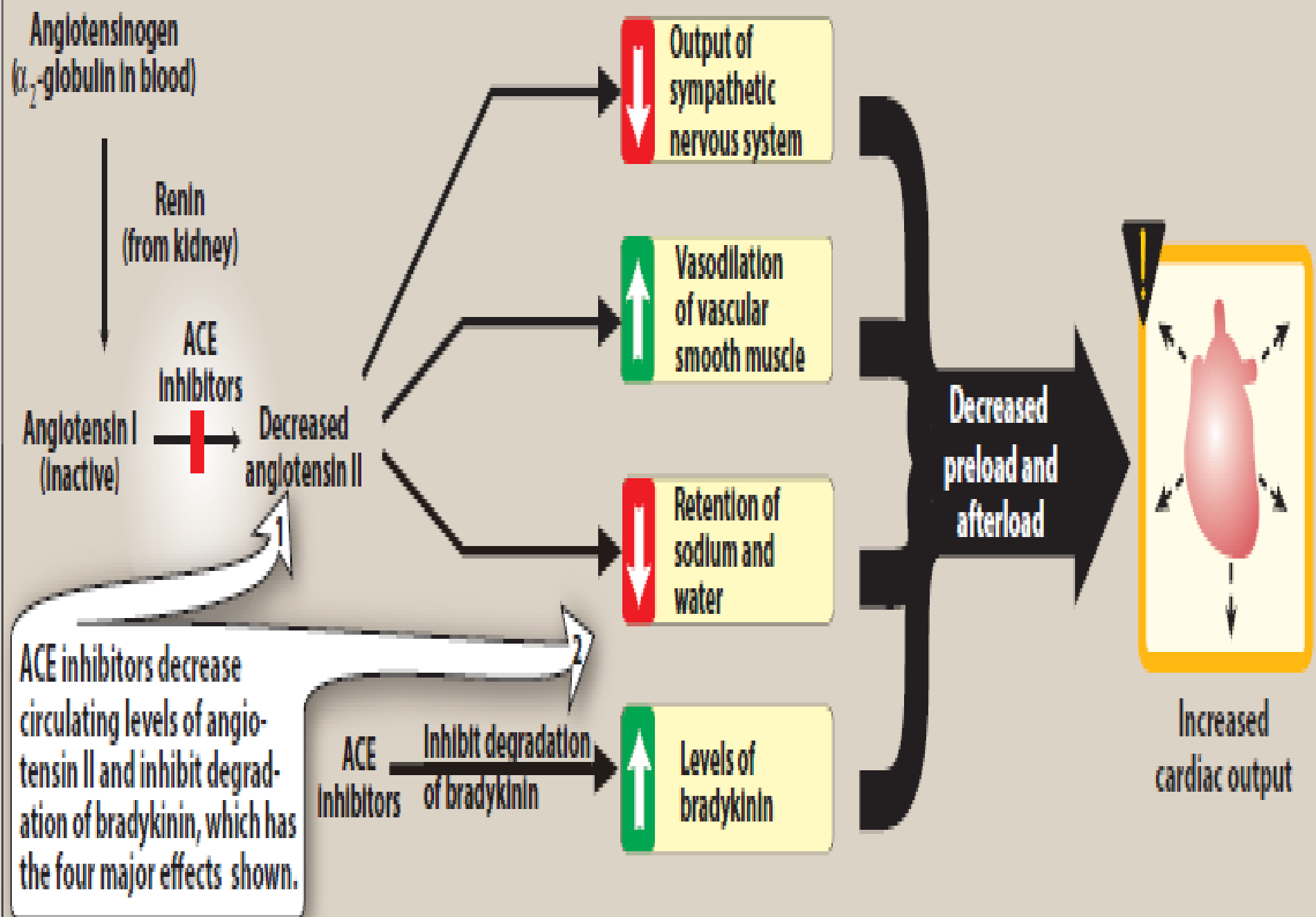
## BUMETANIDE, FUROSEMIDE, TORSEMIDE, ETHACRYNIC ACID

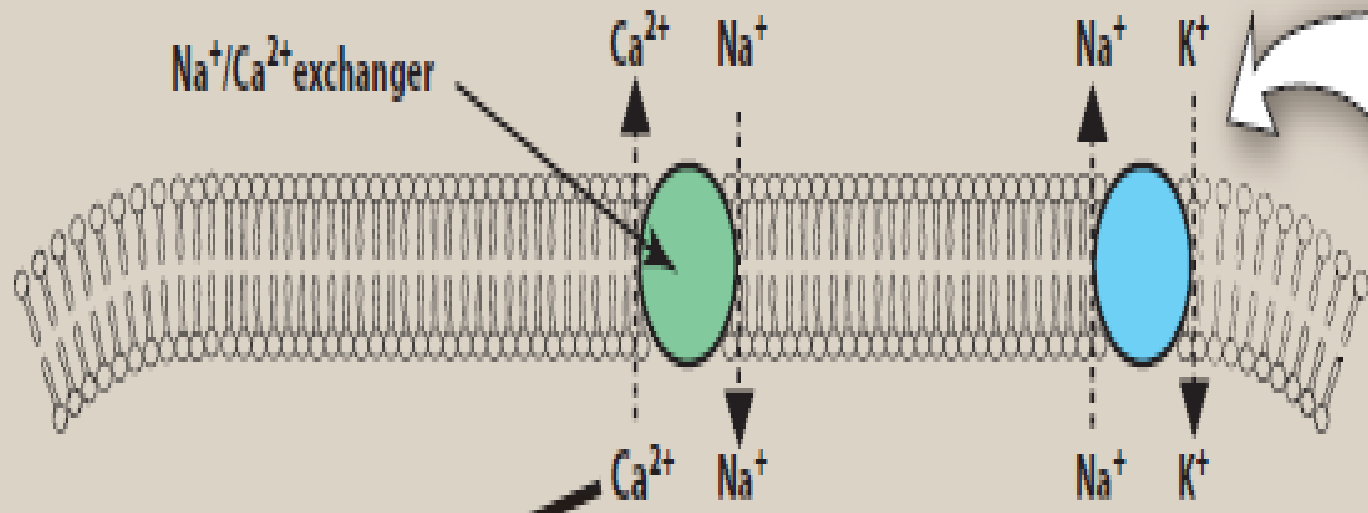
- The loop diuretics inhibit the  $\text{Na}^+/\text{K}^+/2\text{Cl}^-$  cotransport in the ascending loop of Henle, resulting in retention of  $\text{Na}^+$ ,  $\text{Cl}^-$ , and water in the tubule.
- These drugs are the most efficacious of the diuretics.

# Drugs used in heart failure



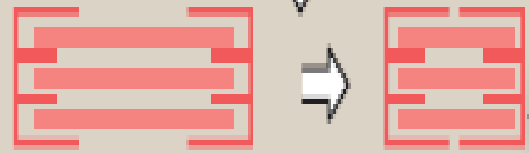
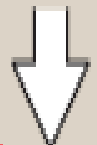






**1** Digoxin inhibits  $\text{Na}^+/\text{K}^+$  exchange by  $\text{Na}^+/\text{K}^+$ -ATPase.

↑ Free  $\text{Ca}^{2+}$



Myofibrils

**2** The concentration of intracellular  $\text{Na}^+$  increases, and the concentration gradient across the membrane decreases.

**3** Increased  $\text{Na}^+$  decreases the driving force for the  $\text{Na}^+/\text{Ca}^{2+}$  exchanger, so there is decreased extrusion of  $\text{Ca}^{2+}$  into the extracellular space.

# Drugs used in angina pectoris

