

ผลของยาโรคหัวใจกับ

การออกกำลังกาย
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ยาที่ใช้บ่อยในโรคหัวใจขาดเลือด

- ♥ Betablocker
- ♥ Diuretic
- ♥ Nitrate
- ♥ Calcium channel blocker
- ♥ Other vasodilator

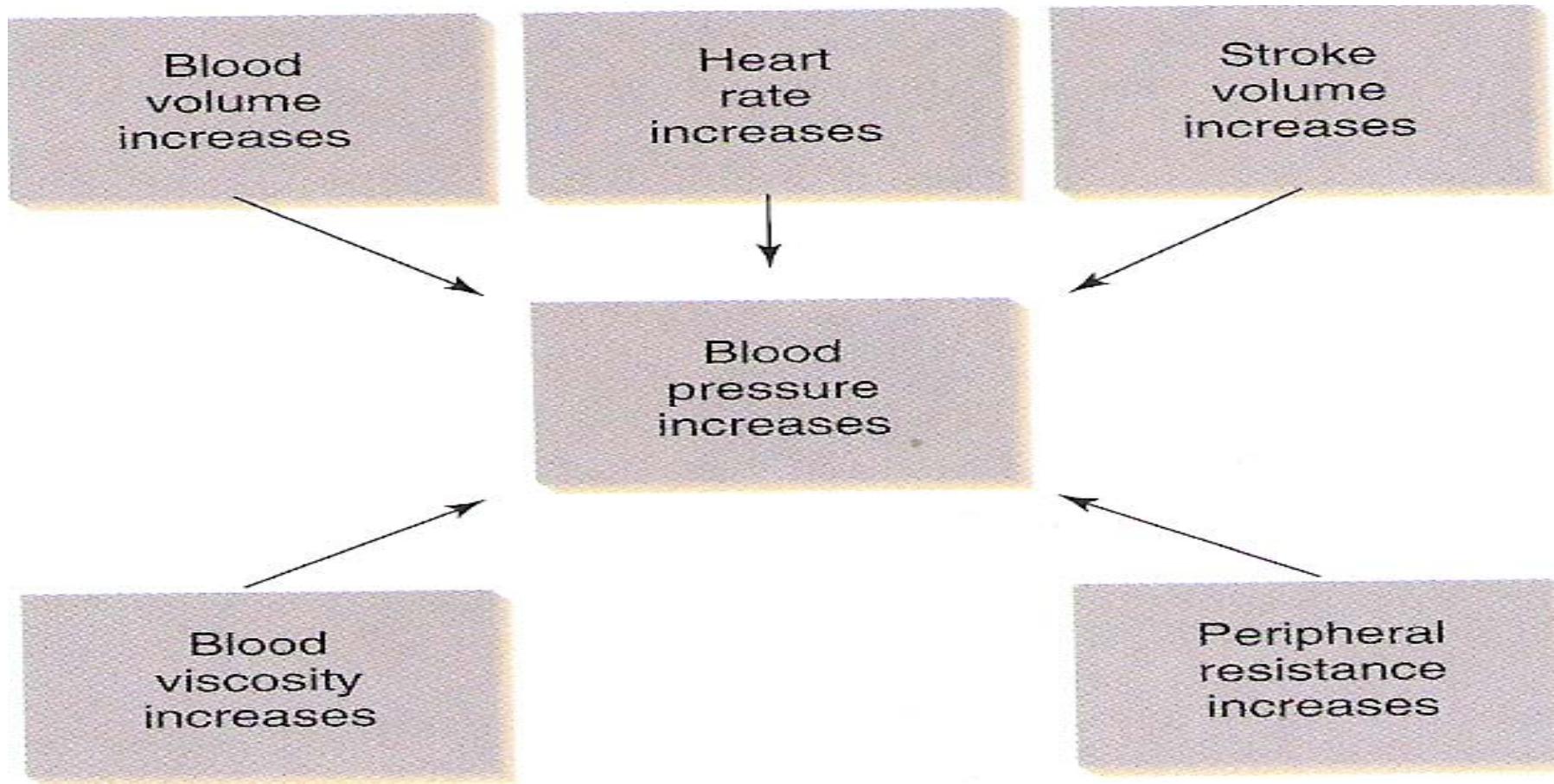


FIGURE 9.8 Some factors that influence arterial blood pressure.

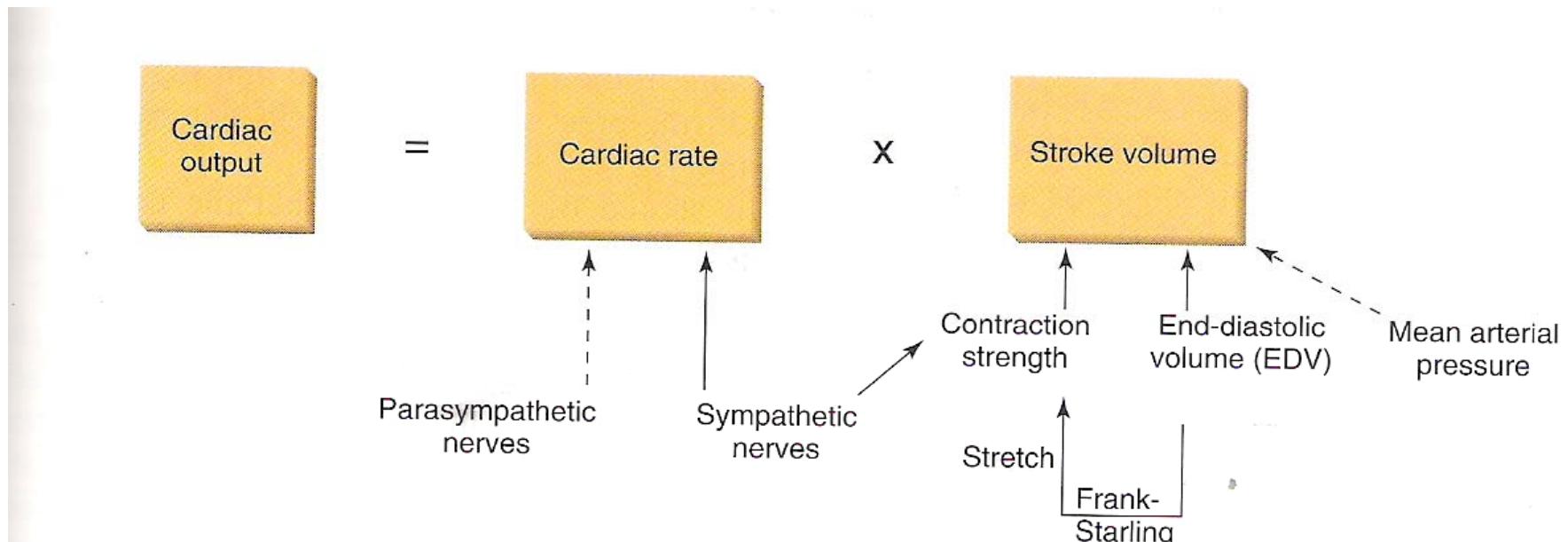
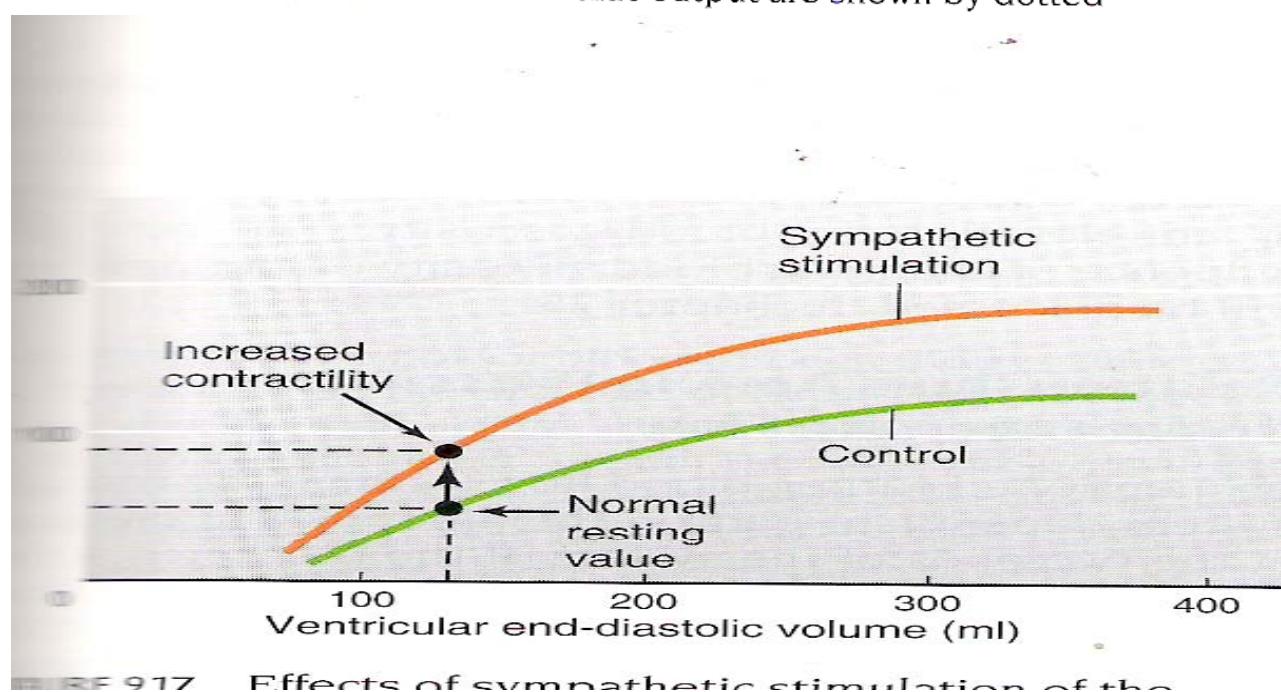


FIGURE 9.18 Factors that regulate cardiac output. Variables that stimulate cardiac output are shown by solid arrows, while factors that reduce cardiac output are shown by dotted arrows.



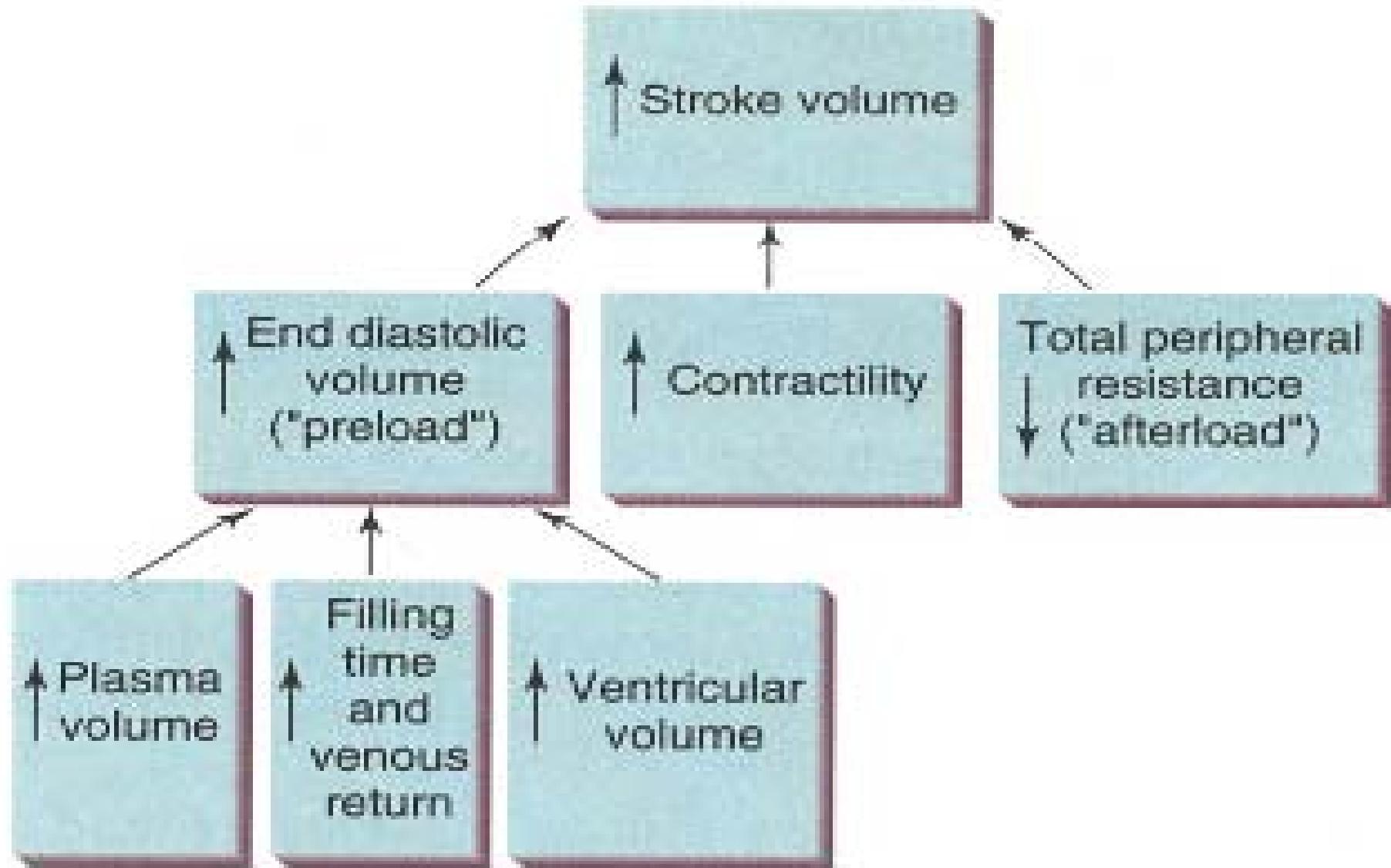


Figure 13.2
Factors increasing stroke volume.

Betablocker

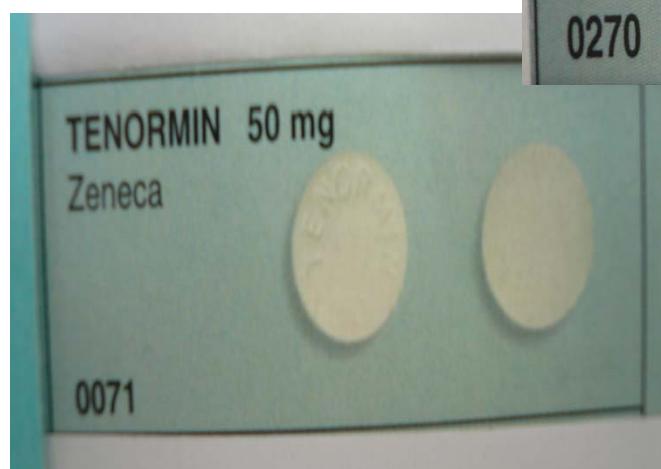
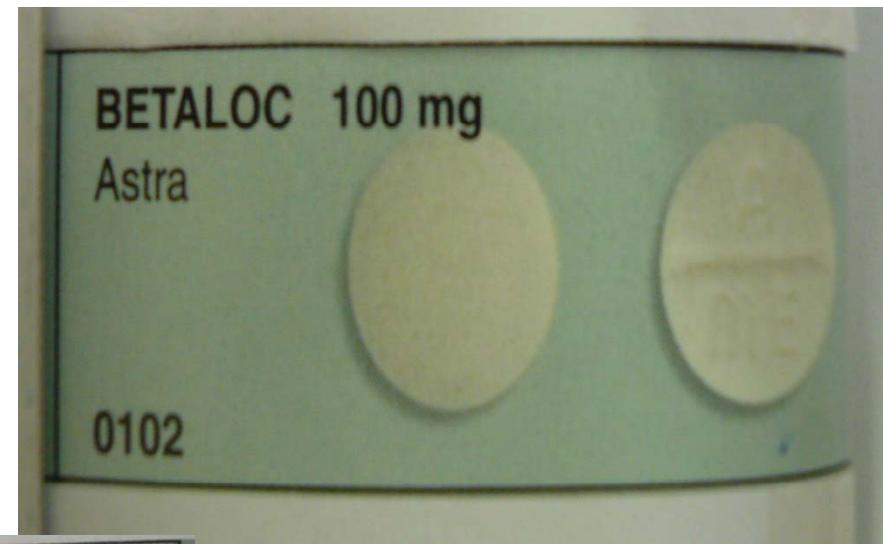
♥ Common use in :

- ♥ Hypertension
- ♥ Angina pectoris in ischemic heart disease
- ♥ Arrhythmia

♥ Mechanism :

- ♥ Block beta receptor → slow heart rate
- ♥ 2 groups : selective beta-1 receptor blocker
: non selective beta blocker

eq..propranolol,atenolol,metoprolol...



Betablocker : effect on exercise

- + Slow heart rate 15-60 beats/min
- + Increase diastole
 - increase coronary perfusion
- + Increase myocardial oxygen uptake
- + No effect on maximal exercise capacity
- + Same training effect by exercise training

Betablocker and exercise prescription

- ♥ No effect on heart rate & VO₂ relationship
 - ♥ HR max. usually → 110-120 beats/min
 - ♥ X HR max = 220 – age
 - ♥ What you should do?
 1. exercise stress test
 2. rate perceived exertion (อัตราความเหนื่อย)
- RPE < or = 15**
3. training heart rate = resting HR.+20



Diuretic

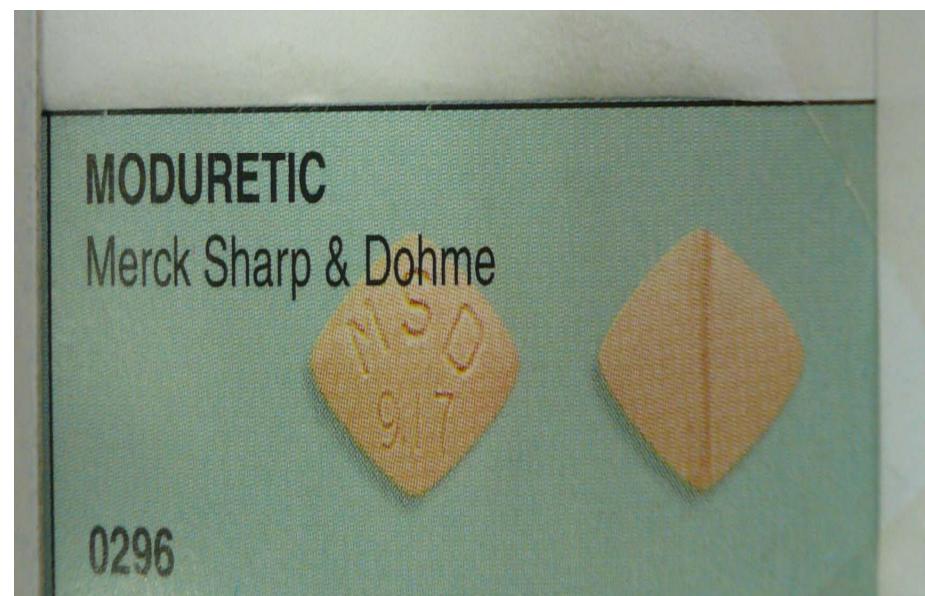
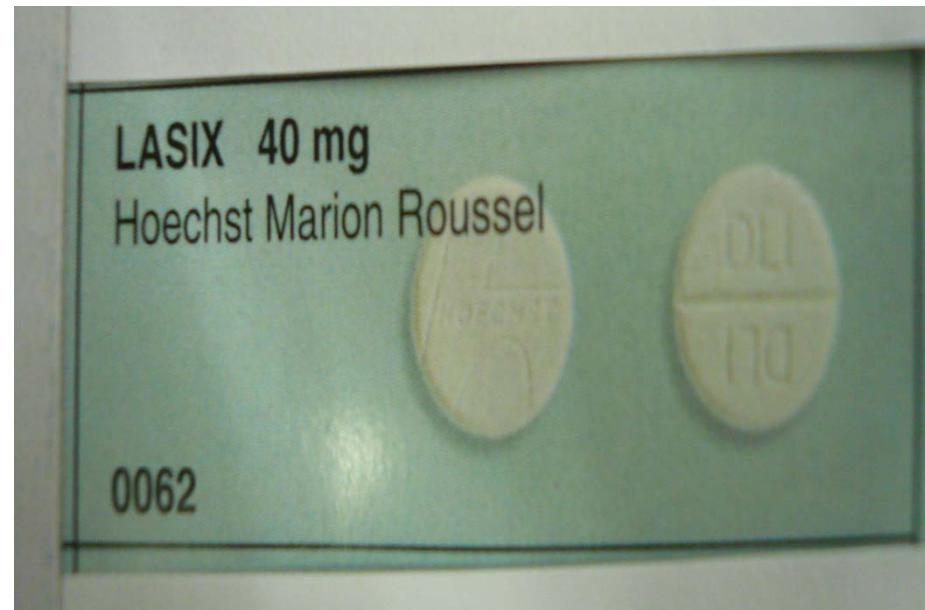
♥ Common use in

- 1.hypertension
- 2.ERDS
- 3.heart failure

♥ Mechanism

- direct effect at kidney
- 2 groups : K-sparing
 - : non K-sparing

eq. HCTZ,furosamide,spironolactone



Diuretic: effect on exercise

- Decrease circulatory volume
- Decrease blood pressure
- Less effect on heart rate
- Overdose can cause
 - 1.reflex tachycardia
 - 2.orthostatic or postural hypotension

***** be careful during and post exercise**

- Normal heart rate response

**Beware of diuretic side effect

- ♥ Electrolyte imbalance

- hyponatremia

- hypokalemia → + PVC

- muscle fatigue

- weakness

- ♥ Hyperglycemia

- ♥ hypercholesterolemia

- ♥ Increase serum uric acid

Diuretic and exercise prescription

- ♥ The same as normal prescription
- ♥ Beware of side effect so....
 - 1.history of fatigue,weakness,joint pain, palpitation,tiredness
 - 2.rule out hyperglycemia ...check CBG.
 - 3.pulse rate,heart rate examination to rule out arrhythmia
- ♥ **Avoid exercise in extreme hot weather**

Nitrate

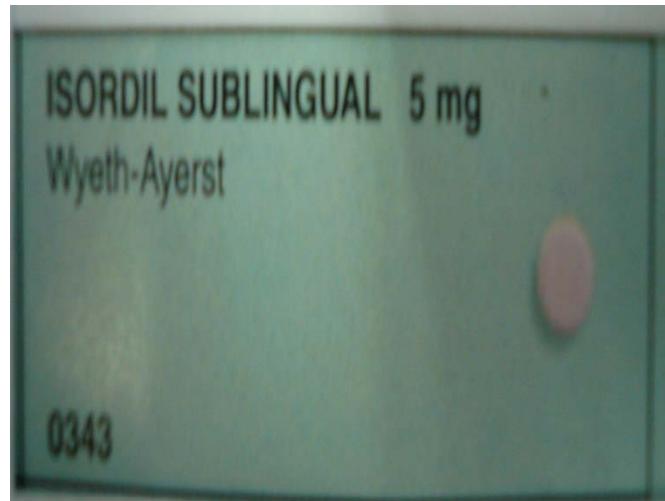
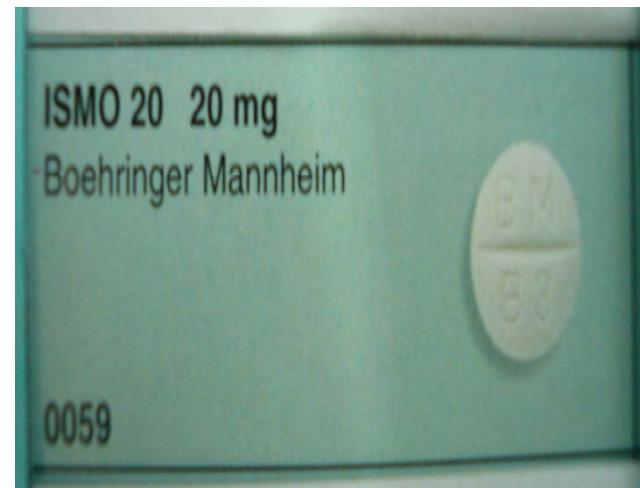
♥ Common use in..

- 1.angina pectoris
- 2.acute coronary syndrome
- 3.congestive heart failure

♥ Mechanism :

- coronary vasodilator
- venodilator→decrease preload
- artery dilator→decrease afterload

♥ Isosorbide dinitrate,isosorbide 5-mononitrate
nitroglycerin



Nitrate: effect on exercise

- Peripheral vasodilator

- decrease venous return
- decrease resting heart rate
- decrease myocardial oxygen consumption
- increase angina threshold
- increase functional capacity

- high dose can cause

- 1.reflex tachycardia
- 2.orthostatic or postural hypotension

Nitrate and exercise prescription

- ♥ Remain the same response as normal
 - ♥ No need to change exercise prescription
 - ♥ Beware the serious side effect of
“post exercise hypotension”
-
- ♥ Need to prolong cool down
 - ♥ Avoid sudden stop exercise

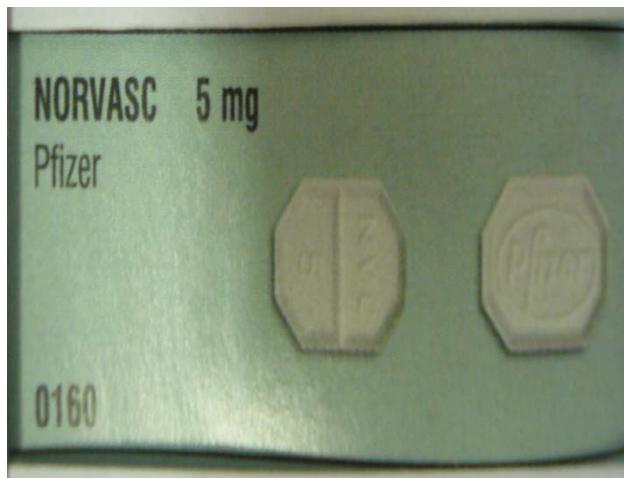
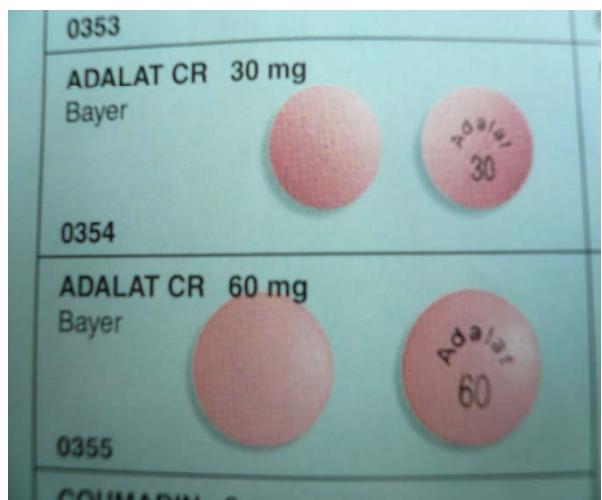
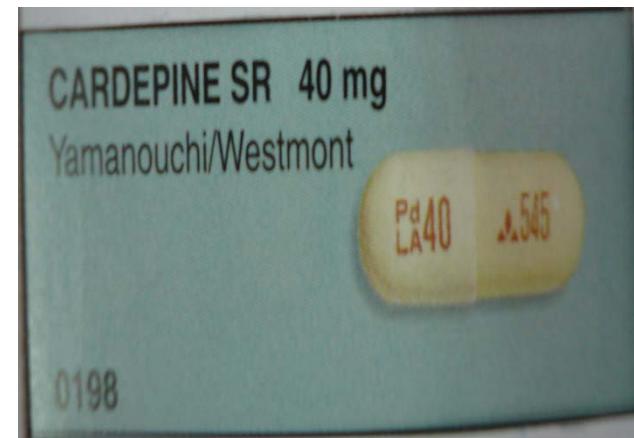
Calcium channel blocker (CCB)

♥ Common use in

- 1.chronic stable angina
- 2.hypertension

♥ Mechanism

- inhibit calcium influx at myocardium and smooth muscle of blood vessel
- at heart : decrease contractility
 : decrease myocardial oxygen consumption
- at vessel :decrease afterload>preload



CCB: effect on exercise

- increase angina threshold
- increase functional capacity
- Increase exercise tolerance

- high dose can cause
 - 1.reflex tachycardia
 - 2.orthostatic or postural hypotension

CCB and exercise prescription

- ♥ Remain the same response as normal
- ♥ No need to change exercise prescription
- ♥ Beware the serious side effect of
“post exercise hypotension”

- ♥ Need to prolong cool down
- ♥ Avoid sudden stop exercise

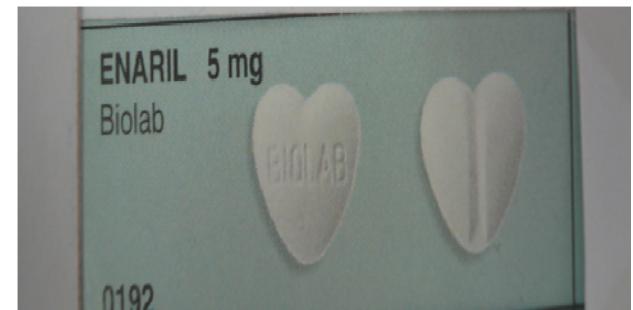
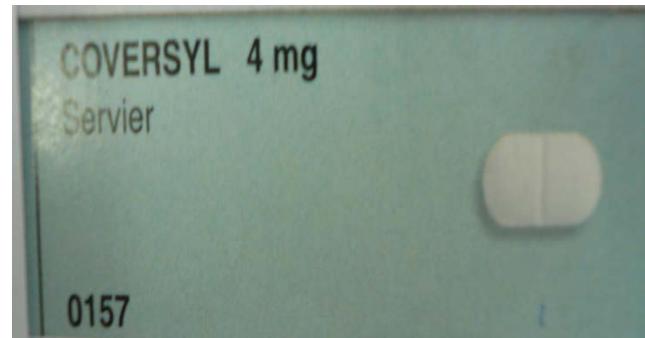
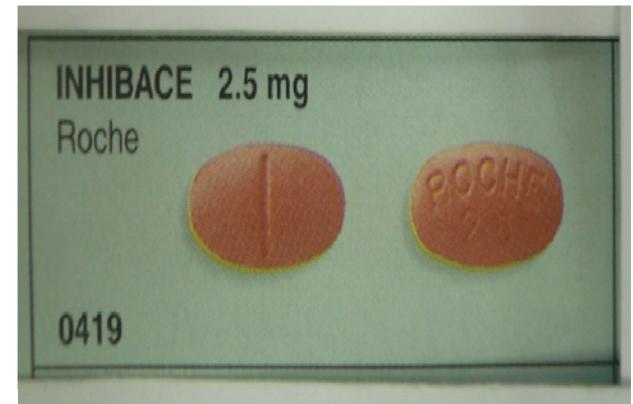
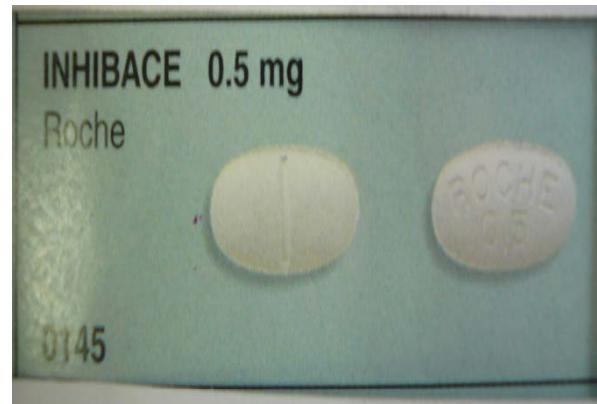
Other vasodilators

1. Alpha-2 agonist eq. clonidine, methyldopa
2. Alpha blocker eq. Prasozin
3. ACEI eq. Enalapril, captopril, perindopril
4. Angiotensin receptor type 1 blocker (ARB)

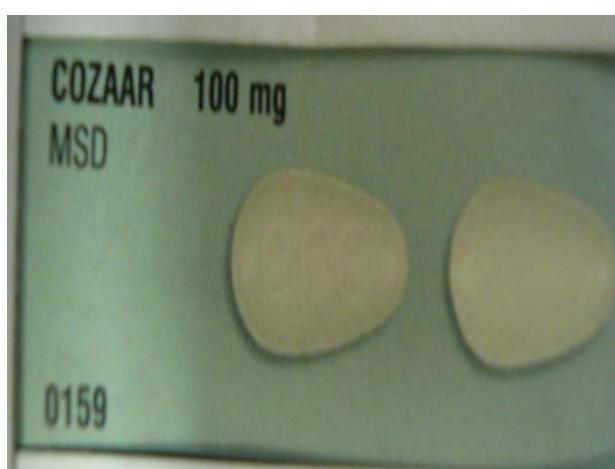
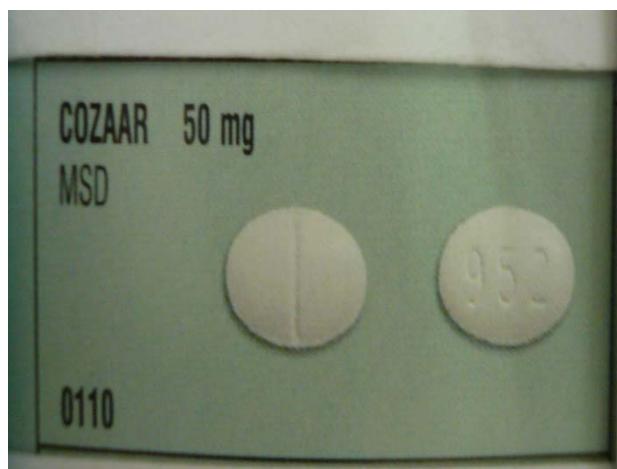
**Beware the serious side effect of
“post exercise hypotension”

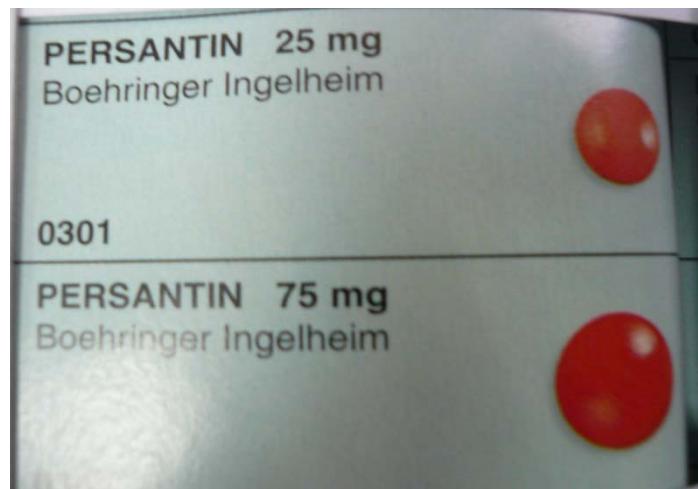
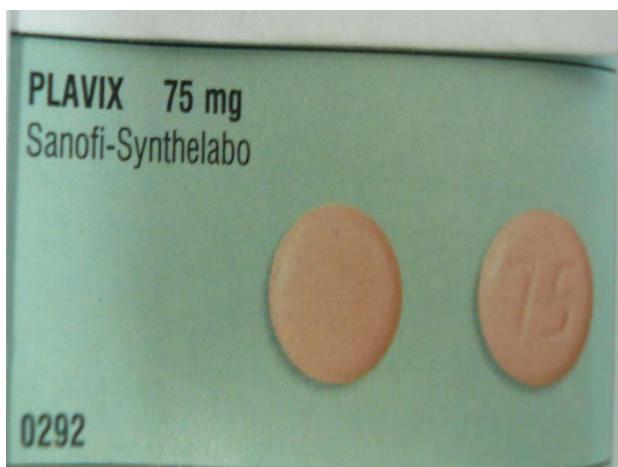
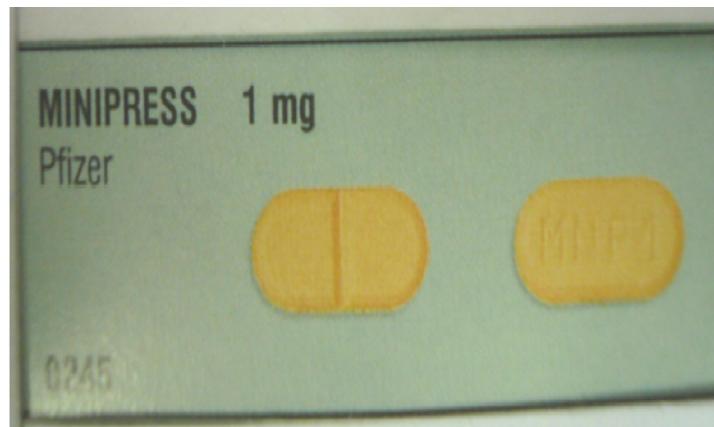
ACEI..

(Angiotensin Converting Enzyme Inhibitor)



Angiotensin receptor type 1 blocker (ARB)





Combined cardiac drugs used

1. >1 vasodilator

:CCB and nitrate

→beware of hypotension

→postural

→post exercise

2. CCB and betablocker

:should do exercise test

:may use low intensity exercise

3. ACEI and potassium sparing diuretic

:risk of hyperkalemia

Summary of cardiac drugs use

1. same training effect as normal
2. no need to change exercise prescription
except...beta blocker
3. beware of drugs side effect
 - :electrolyte imbalance
 - :hypotension

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