

# Pharmacology Team 431

Lecture :

## Potassium Sparing Diuretics


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# Potassium Sparing Diuretics

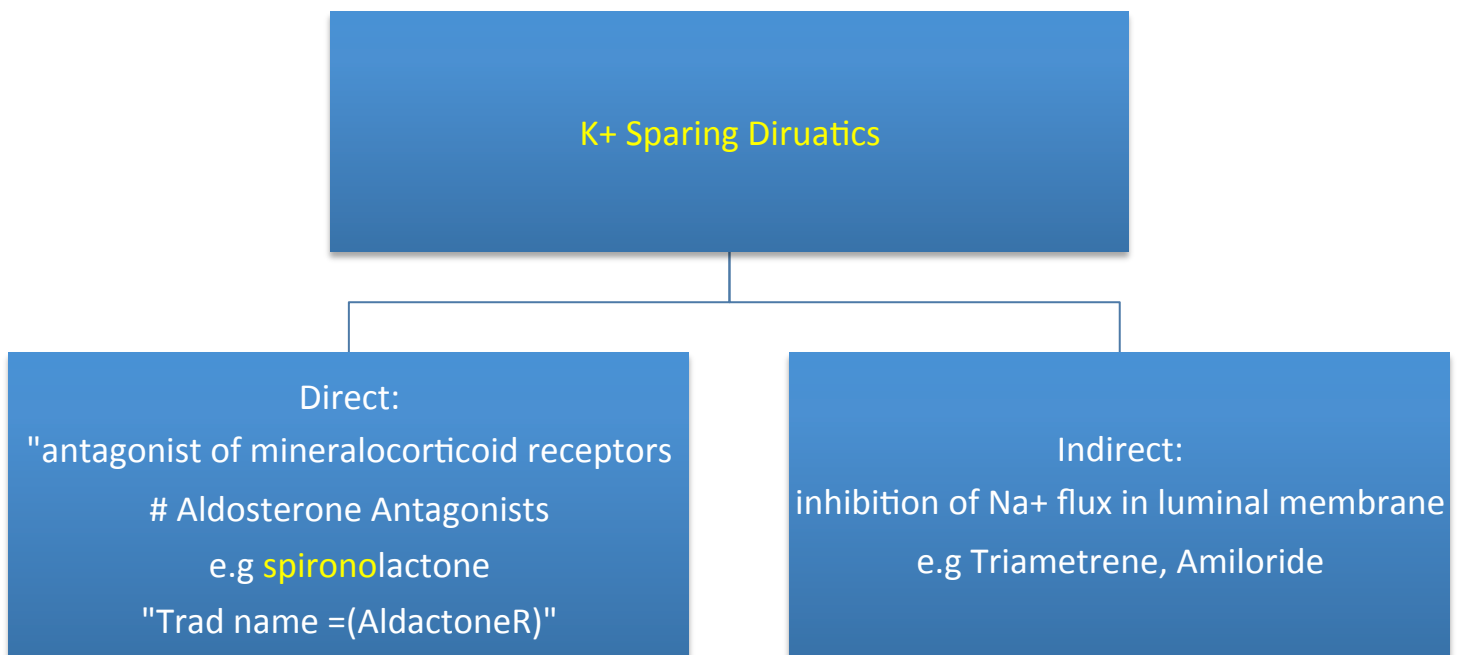
## What's Potassium Sparing Diuretics ?

Is are diuretic "diuretic is drug that increase urine output" drugs that do not promote the secretion of potassium into the urine

**"Diuretics that inhibit transport in the Cortical Collecting Tubule"**

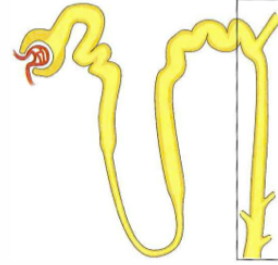
# Why does the natriuretic activity of this group has limited range (less than 5%) but d. clinically very important.?

Act in collecting tubules and ducts by inhibiting Na re-absorption and K & H secretion



## Spironolactone (AldactoneR):

Synthetic steroids acts as competitive antagonist of adlosterone with slow onset of action.



**Site of Action:** act in the collecting tubule

### MOA:

Aldosterone enhance  $K^+$  secretion by increasing  $Na^+/K^+$  ATPase and the same for  $H^+$ . Therefore, Spironolactone binds to mineralocorticoid receptors

“Lippincott: Spironolactone is asynthetic steroid that antagonizes aldosterone at intracellular cytoplasmic receptor sites. The *spironolactone-receptor* complex is inactive. That is, it prevents translocation of the receptor complex into the nucleus of the target cell; thus, it cannot bind to DNA. This results in a failure to produce proteins that are normally synthesized in response to aldosterone. These mediator proteins normally stimulate the  $Na^+/K^+$ -exchange sites of the collecting tubule. Thus, a lack of mediator proteins prevents  $Na^+$  reabsorption and, therefore,  $K^+$  and  $H^+$  secretion”

Dr.Najeeb Explanation “just 5 minutes”:

Click here: [https://www.sugarsync.com/pf/D7431709\\_65906123\\_751660](https://www.sugarsync.com/pf/D7431709_65906123_751660)

### Pharmacodynamics:

- ↑ urinary Na excretion
- ↓ urinary K excretion (hyperkalemia)
- ↓ H secretion (acidosis)

### Clinical Use:

1-Drug of choice for patients with hepatic cirrhosis (important)

2- As diuretics in states of primary mineralocorticoid excess:

- Conn’s syndrome: Aldosterone-Producing Adenoma “Tumor”
- Ectopic ACTH production e.g Cushing's disease:

or to secondary aldosteronism from CHF; Hepatic Cirrhosis , Nephrotic syndrome.

2- To overcome the hypokalemic action of diuretics.

## Treatment of hypertension (combined with thiazide or loop diuretics to correct for hypokalemia).

3- **Hirsutism**: “Wiki: is the excessive hairiness[1] on women[2] in those parts of the body where terminal hair does not normally occur or is minimal” “doctor didn’t explain how so just remember it”

### Side Effects:

1- Hyperkalemia (increases )

2- Hyperchloremic metabolic acidosis

3- **Antiandrogenic effects** (e.g. gynecomastia , impotence **WHY?** “lippincott: Because it chemically resembles some of the sex steroids, *spironolactone* may act at receptors in other organs to induce gynecomastia in males and menstrual irregularities in females; therefore, the drug should not be given at high doses on a chronic basis”,) **with spironolactone**

, kidney stone with Triametrene.

4- **GIT upset and peptic ulcer**

### Diuretics Combination preparations:

Examples: “Doctor said u just need to understand the concept”

DyazideR = Triametrene 50 mg + Hydrochlorothiazide HCT 25 mg

AldactazideR= Spironolactone 25 mg + HCT 25 mg

ModureticR = Amiloride 5 mg + HCT 50 mg

□ **Why?** because other diuretics is potassium wasting diuretics = hypokalemia

to avoid that we combine these drugs with potassium sparing diuretics.

□ **Note** : thiazides should always be there

### Contraindications:

- **Hyperkalaemia: as in chronic renal failure, K+ supplementation,  $\beta$ -blockers or ACE inhibitors.**
- Oral K administration
- **liver disease (dose adjustment is needed)**

## Questions:

**1- An alcoholic male has developed hepatic cirrhosis. To control the ascites and edema, he is prescribed which one of the following ?**

- a) Hydrochlorothiazide.
- b) Acetazolamide.
- c) Spironolactone.

**2- Patient with Chronic renal failure. He was given B-blocker drug .which group of diuretic it is contraindication to use it?**

- a) Loop diuretics
- b) Thiazide diuretics
- c) K-sparing diuretics

**3- What are the Side Effects of K-sparing diuretics?**

- a) Metabolic alkalosis
- b) Hyperuricaemia (gout).
- c) Gynaecomastia .

**Answers: 1- c, 2-c, 3-c.**