NAME(S): **Generic:** benazepril (ben AY ze pril) | **Brand:** Lotensin

PHARMACOLOGIC & THERAPEUTIC CLASS: Anti-hypertensive | Angiotensin-Converting Enzyme (ACE) Inhibitor

DOSAGE FORM & STRENGTH: **Tablet:** 5 mg, 10 mg, 20 mg, 40 mg

INDICATION(S) & DOSING(S): **ADULTS**

1. **Hypertension:** Tx range b/t 10-40 mg/day PO divided qd-bid. Initiate at 10 mg PO qd with a max dose of 80 mg/day. If pt is on a diuretic initiate at 5 mg PO qd.

- OFF LABEL | **Heart Failure:** Tx range b/t 5-20 mg PO qd. Initiate 5 mg PO qd with a max of 20 mg/day.

INDICATION(S) & DOSING(S): **PEDIATRICS** (6 years of age and older)

1. **Hypertension:** Tx wt based dosing range b/t 0.1-0.6 mg/kg/dose PO qd. Initiate at 0.2 mg/kg/dose PO qd up to 10 mg/day w/ a max of 0.6 mg/kg/day up to 40 mg/day.

MECHANISM OF ACTION & PHARMACOLOGY

- **MOA:** Competitively inhibits the angiotensin 1 converting enzyme (ACE). Inhibition of the enzyme prevents the conversion of angiotensin I → angiotensin II which is a potent vasoconstrictor. The decrease of angiotensin II also increases renin activity and reduces the secretion of aldosterone. | **Absorption** is rapid at 37% w/ minimal changes if taken w/ or w/o food. | Rapidly hepatically **metabolized** to the active metabolite (benazeprilat). | 20% is **excreted** through the urine as the active metabolite and 12% as other metabolites. | Regarding the **onset of action**, the peak effect occurs w/in 1-2 hours after 2-20 mg dose. | The **time to peak** of the parent drug is b/t 0.5-1 hour and the active metabolite is 1-2 hours (fasting) and 2-4 hours (non-fasting). | **Duration of action** regarding the reduction of the ACE activity is 24 hours w/ >90% of ACE activity halted after a 5-20 mg dose. | **Half-life elimination** for the drug is ~5 hours in children and ~22 hours in adults. The active metabolite is 10-11 hours. | The active metabolite and the drug is ~95-97% **protein bound** respectively.

SPECIAL POPULATIONS & CONSIDERATIONS

- **African Americans:** Decreased efficacy when used as monotherapy. | **Renal Impairment:** If CrCl <30 or on hemodialysis (HD) initiate at 5 mg qd w/ max of 40 mg/day. | **Hepatic Impairment:** No adjustment needed. | **Elderly**: Consider lower doses. | **Contraindicated or exercise caution**: Hx of angioedema from ACE inhs, African Americans, renal impairment, severe CHF, CAD, and others. | **Pregnancy**: Avoid use. Risk of fetal and neonatal harm/death in 2nd and 3rd trimester. | **Lactation**: No known risk/harm based on limited data. May use.

SIDE EFFECTS

- **Common**: Cough, fatigue, dizziness, hypotension, hyperkalemia, ↑BUN or Cr, photosensitivity, & hyperuricemia
- **Serious**: Angioedema (head/neck/intestine), severe hyperkalemia/hypotension, agranulocytosis, neutropenia, Stevens-Johnson syndrome (SJS), renal impairment/failure, & others.

BLACK BOX WARNING: **Fetal toxicity –** D/c benazepril ASAP if pregnancy is detected due to direct action on renin-angiotensin system which affected leads to fetal injury/death to fetus.

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DRUG INTERACTIONS

- **Characteristics to consider:** Angioedema, antihypertensive agents, decreased renal activity, hyperkalemia, hypoglycemia, & hyponatremia.
- **Drugs to avoid:** Clonidine, tacrolimus, telmisartan, valsartan, aliskiren, guanfacine, irbesartan, to name a few.
- **Monitor or modify treatment when using the following:** Almotriptan, acyclovir, amphetamines, aripiprazole, armodafinil, aspirin, clozapine, diclofenac, doxepin, nabumetone, mirtazepine, tizanidine, to name a few.

MONITORING PARAMETERS

- Blood pressure (General as well as follow American Diabetes Association guidelines in patients w/ diabetes & HTN), BUN, creatinine, electrolytes, and WBC if pt is renally impaired.

PATIENT COUNSELING INFORMATION

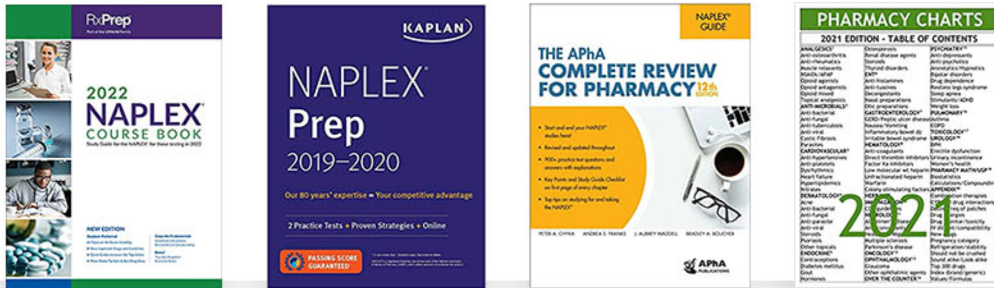
- Benazepril is commonly used to treat **high blood pressure** in **children and adults** and also has off label uses in heart failure for adults.
- It should not be used if pregnant and must be discontinued as soon as possible if pregnancy is determined.
- **Wait 36 hours** before taking if pt as been on **Entresto** or medications that contain **sacubitril.**
- Drink plenty of water when on benazepril and if a dose is missed, skip the dose if it is almost time for the next dose.
- Do not use potassium supplements or salt substitutes unless specifically instructed by MD to do so.
- After **sitting down** or **lying down** for a period of time, **avoid getting up too fast** to avoid **orthostatic hypertension**.

REFERENCE(S)

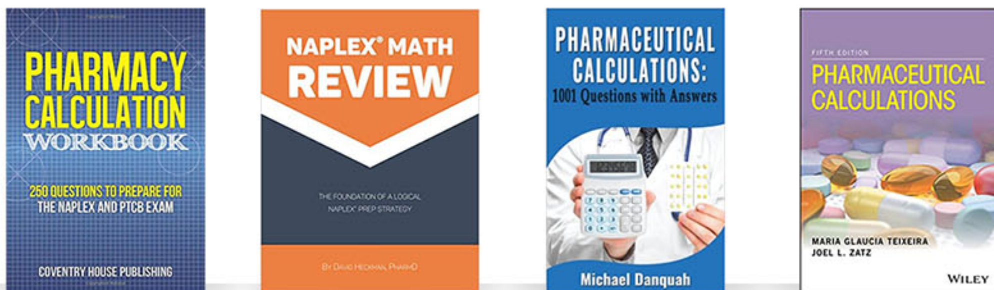
1. https://online.epocrates.com/drugs/91010/benazepril/Monograph
2. https://www.drugs.com/ppa/benazepril.html
3. JNC 8 Algorithm. https://thepafp.org/website/wp-content/uploads/2017/05/2014-JNC-8-Hypertension.pdf
4. Ahajournals.org Hypertension Clinical Practice Guidelines 2020. https://www.ahajournals.org/doi/pdf/10.1161/HYPERTENSIONAHA.120.15026

PREPARE FOR SUCCESS!

Comprehensive (NAPLEX)

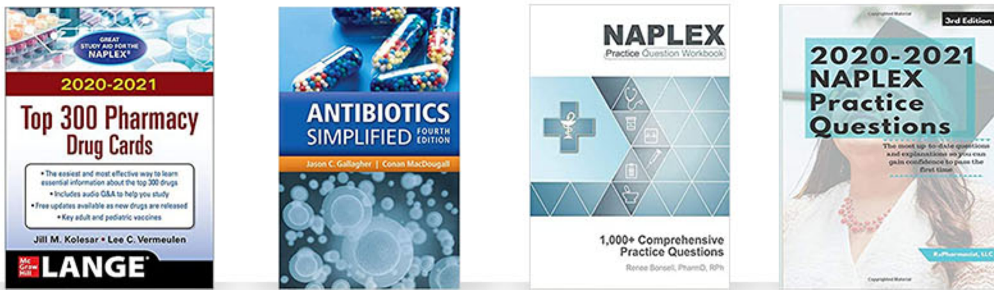


Calculations (NAPLEX)



Pharmacy Law (MPJE)

Supplemental



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