Crown to Cortex

Pharmacology

Antihypertensives

The Unhackables Medical

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How to read this topic

Antihypertensives is a high-yield Pharmacology topic for NEET PG and INI-CET. The safest preparation approach is to organize it by mechanism, classification, prototype drugs, indications, adverse effects, contraindications, interactions, and emergency use. This PDF is designed as a compact final-revision note, not a textbook chapter.

Classify

Place the drug in the correct class before reading the clinical stem.

V

Mechanism

Convert receptor, enzyme, or pathway action into expected benefit.

V

Patient filter

Apply pregnancy, renal/hepatic disease, ECG, electrolyte, allergy, and interaction filters.

V

Exam answer

Choose the drug that fits the indication and avoids the hidden contraindication.

Classification map

Class / axis	High-yield details
RAAS blockers	ACE inhibitors, ARBs, aliskiren
Calcium channel blockers	dihydropyridines and non-DHP
Diuretics	thiazide-like preferred for many patients
Beta blockers	selected comorbid indications
Vasodilators	hydralazine, minoxidil, nitroprusside
Central drugs	clonidine, methyldopa

Prototype drug map

Prototype	What to remember
ACE inhibitors	diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia
ARBs	ACEI alternative without cough
Amlodipine	elderly, isolated systolic HTN; edema
Labetalol	pregnancy HTN and hypertensive emergency
Nitroprusside	emergency; cyanide/thiocyanate toxicity

Mechanism to clinical use

1. RAAS blockers

Mechanism anchor: ACE inhibitors, ARBs, aliskiren. In NEET PG style questions, this becomes important when the stem asks for drug choice, mechanism of toxicity, resistance, organ-specific effect, or a contraindication. Always connect the class to the expected physiological change rather than memorizing the name alone.

Clinical conversion: ask whether the desired effect is immediate symptom relief, disease modification, prophylaxis, reversal of toxicity, or long-term prevention. The same class can be correct or wrong depending on timing, route, patient risk, and monitoring feasibility.

2. Calcium channel blockers

Mechanism anchor: dihydropyridines and non-DHP. In NEET PG style questions, this becomes important when the stem asks for drug choice, mechanism of toxicity, resistance, organ-specific effect, or a contraindication. Always connect the class to the expected physiological change rather than memorizing the name alone.

Clinical conversion: ask whether the desired effect is immediate symptom relief, disease modification, prophylaxis, reversal of toxicity, or long-term prevention. The same class can be correct or wrong depending on timing, route, patient risk, and monitoring feasibility.

3. Diuretics

Mechanism anchor: thiazide-like preferred for many patients. In NEET PG style questions, this becomes important when the stem asks for drug choice, mechanism of toxicity, resistance, organ-specific effect, or a contraindication. Always connect the class to the expected physiological change rather than memorizing the name alone.

Clinical conversion: ask whether the desired effect is immediate symptom relief, disease modification, prophylaxis, reversal of toxicity, or long-term prevention. The same class can be correct or wrong depending on timing, route, patient risk, and monitoring feasibility.

4. Beta blockers

Mechanism anchor: selected comorbid indications. In NEET PG style questions, this becomes important when the stem asks for drug choice, mechanism of toxicity, resistance, organ-specific effect, or a contraindication. Always connect the class to the expected physiological change rather than memorizing the name alone.

Clinical conversion: ask whether the desired effect is immediate symptom relief, disease modification, prophylaxis, reversal of toxicity, or long-term prevention. The same class can be correct or wrong depending on timing, route, patient risk, and monitoring feasibility.

5. Vasodilators

Mechanism anchor: hydralazine, minoxidil, nitroprusside. In NEET PG style questions, this becomes important when the stem asks for drug choice, mechanism of toxicity, resistance, organ-specific effect, or a contraindication. Always connect the class to the expected physiological change rather than memorizing the name alone.

Clinical conversion: ask whether the desired effect is immediate symptom relief, disease modification, prophylaxis, reversal of toxicity, or long-term prevention. The same class can be correct or wrong depending on timing, route, patient risk, and monitoring feasibility.

6. Central drugs

Mechanism anchor: clonidine, methyldopa. In NEET PG style questions, this becomes important when the stem asks for drug choice, mechanism of toxicity, resistance, organ-specific effect, or a contraindication. Always connect the class to the expected physiological change rather than memorizing the name alone.

Clinical conversion: ask whether the desired effect is immediate symptom relief, disease modification, prophylaxis, reversal of toxicity, or long-term prevention. The same class can be correct or wrong depending on timing, route, patient risk, and monitoring feasibility.

Drug signatures

Drug / class	Mechanism cue	Use cue	Toxicity cue
ACE inhibitors	diabetes nephropathy, HF, post-MI	Know preferred indication	Know signature adverse effect
ARBs	ACEI alternative without cough	Know preferred indication	Know signature adverse effect
Amlodipine	elderly, isolated systolic HTN	Know preferred indication	Know signature adverse effect
Labetalol	pregnancy HTN and hypertensive emergency	Know preferred indication	Know signature adverse effect
Nitroprusside	emergency	Know preferred indication	Know signature adverse effect

Clinical edges

- Pregnancy: labetalol, nifedipine, methyldopa; avoid ACEI/ARB/aliskiren
- CKD proteinuria: ACEI/ARB renal protective but monitor creatinine and potassium
- Emergency: IV therapy when acute target-organ damage exists
- Resistant HTN: confirm adherence, remove NSAIDs, evaluate OSA/aldosteronism, add MRA
- For Antihypertensives, start every clinical question by identifying the syndrome, patient risk factors, organ function, pregnancy status, and interacting drugs.
- Prototype drugs are more important than long drug lists; know one clean example for each mechanism.
- Adverse-effect signatures often identify the drug even when the stem hides the class name.
- When two drugs look similar, compare onset, route, elimination, monitoring, and toxicity.

Adverse effects and contraindication logic

ACE inhibitors

Expected exam cue: diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia. When this drug or class appears in a clinical vignette, actively look for allergy, pregnancy risk, renal or hepatic impairment, ECG abnormality, electrolyte disturbance, bleeding risk, respiratory disease, CNS depression, or interacting medicines.

How to eliminate options: reject drugs that worsen the dominant clinical danger in the stem, even if their mechanism seems suitable. This is especially important in pharmacology questions where the wrong option is often a contraindicated first-line drug.

ARBs

Expected exam cue: ACEI alternative without cough. When this drug or class appears in a clinical vignette, actively look for allergy, pregnancy risk, renal or hepatic impairment, ECG abnormality, electrolyte disturbance, bleeding risk, respiratory disease, CNS depression, or interacting medicines.

How to eliminate options: reject drugs that worsen the dominant clinical danger in the stem, even if their mechanism seems suitable. This is especially important in pharmacology questions where the wrong option is often a contraindicated first-line drug.

Amlodipine

Expected exam cue: elderly, isolated systolic HTN; edema. When this drug or class appears in a clinical vignette, actively look for allergy, pregnancy risk, renal or hepatic impairment, ECG abnormality, electrolyte disturbance, bleeding risk, respiratory disease, CNS depression, or interacting medicines.

How to eliminate options: reject drugs that worsen the dominant clinical danger in the stem, even if their mechanism seems suitable. This is especially important in pharmacology questions where the wrong option is often a contraindicated first-line drug.

Labetalol

Expected exam cue: pregnancy HTN and hypertensive emergency. When this drug or class appears in a clinical vignette, actively look for allergy, pregnancy risk, renal or hepatic impairment, ECG abnormality, electrolyte disturbance, bleeding risk, respiratory disease, CNS depression, or interacting medicines.

How to eliminate options: reject drugs that worsen the dominant clinical danger in the stem, even if their mechanism seems suitable. This is especially important in pharmacology questions where the wrong option is often a contraindicated first-line drug.

Nitroprusside

Expected exam cue: emergency; cyanide/thiocyanate toxicity. When this drug or class appears in a clinical vignette, actively look for allergy, pregnancy risk, renal or hepatic impairment, ECG abnormality, electrolyte disturbance, bleeding risk, respiratory disease, CNS depression, or interacting medicines.

How to eliminate options: reject drugs that worsen the dominant clinical danger in the stem, even if their mechanism seems suitable. This is especially important in pharmacology questions where the wrong option is often a contraindicated first-line drug.

Exam traps

- Do not choose a drug only because it belongs to the right class; contraindications can reverse the answer.
- Do not ignore renal or hepatic impairment in dosing questions.
- Drug interactions are commonly tested through enzyme induction, enzyme inhibition, additive toxicity, or pharmacodynamic opposition.
- Emergency therapy depends on speed and route, not only mechanism.
- In Antihypertensives, do not memorize a class without its route, onset, elimination, and monitoring.
- Toxicity questions often hide the drug name and reveal the answer through one adverse-effect signature.
- Contraindications are tested more often than rare mechanisms.
- A drug can be first-line in one patient and dangerous in another.

Last-day revision grid

Question	Answer to recall quickly
Best prototype?	ACE inhibitors, ARBs, Amlodipine, Labetalol
Most tested danger?	toxicity, contraindication, interaction, and monitoring
Emergency angle?	route, onset, antidote, supportive care
Do-not-miss filter?	pregnancy, renal/hepatic failure, ECG/electrolytes, bleeding or respiratory risk

High-yield definitions

Term	Definition / exam meaning
RAAS blockers	ACE inhibitors, ARBs, aliskiren
Calcium channel blockers	dihydropyridines and non-DHP
Diuretics	thiazide-like preferred for many patients
Beta blockers	selected comorbid indications
Vasodilators	hydralazine, minoxidil, nitroprusside
Central drugs	clonidine, methyldopa
ACE inhibitors	diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia
ARBs	ACEI alternative without cough
Amlodipine	elderly, isolated systolic HTN; edema
Labetalol	pregnancy HTN and hypertensive emergency
Nitroprusside	emergency; cyanide/thiocyanate toxicity

How this helps in Antihypertensives: this page is meant to convert memorized pharmacology into option elimination. Read the left column first, then force yourself to say the mechanism, clinical use, toxicity, and reason another option is wrong.

Drug-by-drug comparison

Comparison	How to separate them in an exam stem	Most useful discriminator
ACE inhibitors vs ARBs	ACE inhibitors is recalled by: diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia. ARBs is recalled by: ACEI alternative without cough.	Indication, toxicity pattern, route/onset, or contraindication hidden in the stem.
Amlodipine vs Labetalol	Amlodipine is recalled by: elderly, isolated systolic HTN; edema. Labetalol is recalled by: pregnancy HTN and hypertensive emergency.	Indication, toxicity pattern, route/onset, or contraindication hidden in the stem.

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Toxicity signatures

Drug / class	Toxicity pattern to actively search for	Immediate exam response
ACE inhibitors	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
ARBs	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: ACEI alternative without cough	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Amlodipine	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: elderly, isolated systolic HTN; edema	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Labetalol	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: pregnancy HTN and hypertensive emergency	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Nitroprusside	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: emergency; cyanide/thiocyanate toxicity	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Antihypertensives	Any severe allergy, organ failure, pregnancy risk, or dangerous interaction can override first-line status.	Do not pick a drug only because it is famous.

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Contraindication filters

Clinical filter	What it changes	Exam habit
Pregnancy/lactation	Avoid teratogenic, fetal-toxic, or neonatal-toxic drugs; prefer established safer options.	Always scan age/sex/history lines.
Renal impairment	Accumulation increases toxicity for renally cleared drugs; dose interval may need extension.	Look for creatinine, oliguria, CKD, elderly patient.
Hepatic disease	Reduced metabolism, low albumin, and bleeding risk can change drug choice.	Check jaundice, cirrhosis, INR, albumin.
ECG/electrolytes	QT prolongation, heart block, hypokalemia, and hyperkalemia decide many answers.	Never ignore ECG and potassium.
Respiratory disease	Bronchospasm or respiratory depression risk can make a familiar drug unsafe.	Asthma/COPD/sleep apnea are not decorative details.
Bleeding risk	Antiplatelets, anticoagulants, thrombolytics, NSAIDs, and marrow-toxic drugs need caution.	Check ulcer, surgery, stroke, platelets, INR.
ACE inhibitors	diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia	Ask: where is this drug dangerous?
ARBs	ACEI alternative without cough	Ask: where is this drug dangerous?
Amlodipine	elderly, isolated systolic HTN; edema	Ask: where is this drug dangerous?

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Drug interaction map

Interaction type	Mechanism	Common exam expression
CYP induction	Increases metabolism of substrate drugs and can cause treatment failure.	Rifampicin/carbamazepine/phenytoin reducing OCP, warfarin, antiretroviral, or steroid effect.
CYP inhibition	Raises substrate levels and toxicity.	Macrolide/azole/ritonavir/cimetidine/grapefruit toxicity stem.
Additive toxicity	Two drugs injure the same organ or pathway.	QT plus QT, bleeding plus bleeding, nephrotoxic plus nephrotoxic, CNS depressant plus CNS depressant.
Pharmacodynamic opposition	One drug blocks the desired effect of another.	NSAID reducing antihypertensive effect; beta blocker opposing beta agonist.
ACE inhibitors	diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia	Check whether the vignette adds another drug that amplifies toxicity or reduces benefit.
ARBs	ACEI alternative without cough	Check whether the vignette adds another drug that amplifies toxicity or reduces benefit.
Amlodipine	elderly, isolated systolic HTN; edema	Check whether the vignette adds another drug that amplifies toxicity or reduces benefit.
Labetalol	pregnancy HTN and hypertensive emergency	Check whether the vignette adds another drug that amplifies toxicity or reduces benefit.

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Monitoring and dose adjustment

Monitoring target	Why it matters	What to remember
Clinical endpoint	Symptom relief or prevention outcome confirms benefit.	Pain, BP, seizure control, infection response, glucose, dyspnea, psychosis, bleeding.
Laboratory endpoint	Detects efficacy and silent toxicity.	Renal function, liver enzymes, CBC, electrolytes, coagulation, glucose, drug levels.
ECG	Many drugs alter conduction, QT, or rhythm.	QT prolongation, AV block, QRS widening, torsades risk.
Therapeutic drug monitoring	Needed when therapeutic window is narrow.	Lithium, digoxin, phenytoin, valproate, aminoglycosides, vancomycin, tacrolimus.
ACE inhibitors	Monitoring depends on the toxicity implied by its mechanism and elimination.	diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia
ARBs	Monitoring depends on the toxicity implied by its mechanism and elimination.	ACEI alternative without cough
Amlodipine	Monitoring depends on the toxicity implied by its mechanism and elimination.	elderly, isolated systolic HTN; edema

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Emergency decision table

Emergency scenario	First pharmacology decision	Common mistake
Shock/anaphylaxis/severe acute state	Choose route and onset before elegance of mechanism.	Choosing an oral chronic drug for an emergency.
Poisoning/toxicity	Stabilize airway, breathing, circulation, then antidote if indicated.	Giving antidote while ignoring supportive care.
Severe infection or organ-threatening disease	Start rational empirical therapy promptly, then narrow when data arrives.	Waiting for perfect information in an unstable patient.
Withdrawal or rebound	Recognize dependence physiology and taper/replace appropriately.	Abruptly stopping clonidine, beta blockers, steroids, opioids, alcohol, or benzodiazepines.
Antihypertensives: ACE inhibitors	diabetes nephropathy, HF, post-MI; cough/angioedema/hyperkalemia	Wrong route, delayed onset, or ignored contraindication.
Antihypertensives: ARBs	ACEI alternative without cough	Wrong route, delayed onset, or ignored contraindication.
Antihypertensives: Amlodipine	elderly, isolated systolic HTN; edema	Wrong route, delayed onset, or ignored contraindication.
Antihypertensives: Labetalol	pregnancy HTN and hypertensive emergency	Wrong route, delayed onset, or ignored contraindication.

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INI-CET stem decoding

Stem clue	What it is trying to test	Answer strategy
Age, pregnancy, renal/liver disease	Safety filter rather than diagnosis.	Eliminate unsafe drugs first.
New symptom after drug start	Adverse-effect signature.	Name the drug from toxicity.
Drug added recently	Interaction question.	Check CYP, QT, bleeding, CNS depression, nephrotoxicity.
Emergency wording	Route/onset question.	Prefer fast, titratable, evidence-based acute therapy.
Chronic prevention wording	Outcome benefit question.	Prefer disease-modifying therapy over only symptomatic relief.
RAAS blockers	ACE inhibitors, ARBs, aliskiren	Place this under Antihypertensives, then compare with nearby alternatives.
Calcium channel blockers	dihydropyridines and non-DHP	Place this under Antihypertensives, then compare with nearby alternatives.
Diuretics	thiazide-like preferred for many patients	Place this under Antihypertensives, then compare with nearby alternatives.
Beta blockers	selected comorbid indications	Place this under Antihypertensives, then compare with nearby alternatives.

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Rapid pathway

Read the stem

Disease, severity, age, pregnancy, organ function, emergency status.

V

Name the class

Mechanism and prototype before option elimination.

V

Apply exclusions

Contraindications, interactions, and toxicity signatures.

V

Pick final answer

Most specific safe drug for that exact stem.