



**Crown to Cortex**

# **Pharmacology**

## **Myocardial Infarction and Drugs for Heart Failure**

The Unhackables Medical

[medical.theunhackables.com](https://medical.theunhackables.com)

## How to read this topic

Myocardial Infarction and Drugs for Heart Failure 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.



### Mechanism

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



### Patient filter

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



### Exam answer

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

## Classification map

Class / axis	High-yield details
ACS acute	aspirin, P2Y12 blocker, anticoagulation, nitrates, beta blocker, statin, reperfusion
HFrEF disease modifying	ARNI/ACEI/ARB, beta blocker, MRA, SGLT2 inhibitor
HFrEF symptom relief	loop diuretics, nitrates, hydralazine, digoxin selected
Acute HF	oxygen if hypoxic, IV diuretic, vasodilator, inotrope if shock

## Prototype drug map

Prototype	What to remember
Aspirin	chewed loading in ACS
Clopidogrel/prasugrel/ticagrelor	dual antiplatelet with aspirin
Enoxaparin/heparin	anticoagulation in ACS
Sacubitril-valsartan	mortality benefit in HFrEF
Dobutamine	acute decompensated HF with low output

# Mechanism to clinical use

## 1. ACS acute

Mechanism anchor: aspirin, P2Y12 blocker, anticoagulation, nitrates, beta blocker, statin, reperfusion. 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. HFrEF disease modifying

Mechanism anchor: ARNI/ACEI/ARB, beta blocker, MRA, SGLT2 inhibitor. 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. HFrEF symptom relief

Mechanism anchor: loop diuretics, nitrates, hydralazine, digoxin selected. 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. Acute HF

Mechanism anchor: oxygen if hypoxic, IV diuretic, vasodilator, inotrope if shock. 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
Aspirin	chewed loading in ACS	Know preferred indication	Know signature adverse effect
Clopidogrel/prasugrel/ticagrelor	dual antiplatelet with aspirin	Know preferred indication	Know signature adverse effect
Enoxaparin/heparin	anticoagulation in ACS	Know preferred indication	Know signature adverse effect
Sacubitril-valsartan	mortality benefit in HFrEF	Know preferred indication	Know signature adverse effect
Dobutamine	acute decompensated HF with low output	Know preferred indication	Know signature adverse effect

## Clinical edges

- Contraindications: avoid nitrates with PDE5 inhibitors; avoid beta blocker in acute pulmonary edema/shock
- Monitoring: BP, HR, ECG, potassium, creatinine, bleeding
- STEMI: reperfusion is time-critical; fibrinolysis if PCI unavailable and no contraindication
- Digoxin: symptom and hospitalization benefit, not mortality; toxicity worsened by hypokalemia
- For Myocardial Infarction and Drugs for Heart Failure, 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

### Aspirin

Expected exam cue: chewed loading in ACS. 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.

### Clopidogrel/prasugrel/ticagrelor

Expected exam cue: dual antiplatelet with aspirin. 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.

### Enoxaparin/heparin

Expected exam cue: anticoagulation in ACS. 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.

### Sacubitril-valsartan

Expected exam cue: mortality benefit in HFrEF. 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.

### Dobutamine

Expected exam cue: acute decompensated HF with low output. 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 Myocardial Infarction and Drugs for Heart Failure, 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?	Aspirin, Clopidogrel/prasugrel/ticagrelor, Enoxaparin/heparin, Sacubitril-valsartan
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
ACS acute	aspirin, P2Y12 blocker, anticoagulation, nitrates, beta blocker, statin, reperfusion
HFrEF disease modifying	ARNI/ACEI/ARB, beta blocker, MRA, SGLT2 inhibitor
HFrEF symptom relief	loop diuretics, nitrates, hydralazine, digoxin selected
Acute HF	oxygen if hypoxic, IV diuretic, vasodilator, inotrope if shock
Aspirin	chewed loading in ACS
Clopidogrel/prasugrel/ticagrelor	dual antiplatelet with aspirin
Enoxaparin/heparin	anticoagulation in ACS
Sacubitril-valsartan	mortality benefit in HFrEF
Dobutamine	acute decompensated HF with low output
Hemodynamics	Map drug action to preload, afterload, contractility, heart rate, and conduction.
Outcomes	Mortality benefit matters more than symptom relief in chronic disease.

How this helps in Myocardial Infarction and Drugs for Heart Failure: 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
Aspirin vs Clopidogrel/prasugrel/ticagrelor	Aspirin is recalled by: chewed loading in ACS. Clopidogrel/prasugrel/ticagrelor is recalled by: dual antiplatelet with aspirin.	Indication, toxicity pattern, route/onset, or contraindication hidden in the stem.
Enoxaparin/heparin vs Sacubitril-valsartan	Enoxaparin/heparin is recalled by: anticoagulation in ACS. Sacubitril-valsartan is recalled by: mortality benefit in HFrEF.	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
Aspirin	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: chewed loading in ACS	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Clopidogrel/prasugrel/ticagrelor	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: dual antiplatelet with aspirin	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Enoxaparin/heparin	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: anticoagulation in ACS	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Sacubitril-valsartan	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: mortality benefit in HFrEF	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Dobutamine	Link the prototype clue to organ toxicity, laboratory change, ECG change, bleeding, CNS depression, allergy, or pregnancy risk. Cue: acute decompensated HF with low output	Stop/avoid the drug if the stem contains the danger sign; choose antidote or safer alternative when asked.
Myocardial Infarction and Drugs for Heart Failure	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.
Aspirin	chewed loading in ACS	Ask: where is this drug dangerous?
Clopidogrel/prasugrel/ticagrelor	dual antiplatelet with aspirin	Ask: where is this drug dangerous?
Enoxaparin/heparin	anticoagulation in ACS	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.
Aspirin	chewed loading in ACS	Check whether the vignette adds another drug that amplifies toxicity or reduces benefit.
Clopidogrel/prasugrel/ticagrelor	dual antiplatelet with aspirin	Check whether the vignette adds another drug that amplifies toxicity or reduces benefit.
Enoxaparin/heparin	anticoagulation in ACS	Check whether the vignette adds another drug that amplifies toxicity or reduces benefit.
Sacubitril-valsartan	mortality benefit in HFrEF	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.
Aspirin	Monitoring depends on the toxicity implied by its mechanism and elimination.	chewed loading in ACS
Clopidogrel/prasugrel/ticagrelor	Monitoring depends on the toxicity implied by its mechanism and elimination.	dual antiplatelet with aspirin
Enoxaparin/heparin	Monitoring depends on the toxicity implied by its mechanism and elimination.	anticoagulation in ACS

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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.
Myocardial Infarction and Drugs for Heart Failure: Aspirin	chewed loading in ACS	Wrong route, delayed onset, or ignored contraindication.
Myocardial Infarction and Drugs for Heart Failure: Clopidogrel/prasugrel/ticagrelor	dual antiplatelet with aspirin	Wrong route, delayed onset, or ignored contraindication.
Myocardial Infarction and Drugs for Heart Failure: Enoxaparin/heparin	anticoagulation in ACS	Wrong route, delayed onset, or ignored contraindication.
Myocardial Infarction and Drugs for Heart Failure: Sacubitril-valsartan	mortality benefit in HFrEF	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.
ACS acute	aspirin, P2Y12 blocker, anticoagulation, nitrates, beta blocker, statin, reperfusion	Place this under Myocardial Infarction and Drugs for Heart Failure, then compare with nearby alternatives.
HFrEF disease modifying	ARNI/ACEI/ARB, beta blocker, MRA, SGLT2 inhibitor	Place this under Myocardial Infarction and Drugs for Heart Failure, then compare with nearby alternatives.
HFrEF symptom relief	loop diuretics, nitrates, hydralazine, digoxin selected	Place this under Myocardial Infarction and Drugs for Heart Failure, then compare with nearby alternatives.
Acute HF	oxygen if hypoxic, IV diuretic, vasodilator, inotrope if shock	Place this under Myocardial Infarction and Drugs for Heart Failure, then compare with nearby alternatives.

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## Rapid pathway

### Read the stem

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



### Name the class

Mechanism and prototype before option elimination.



### Apply exclusions

Contraindications, interactions, and toxicity signatures.



### Pick final answer

Most specific safe drug for that exact stem.