MEDLEY

Medical AI Ensemble Clinical Decision Report

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Primary Diagnostic Consensus

Diagnosis	ICD-10	Agreement	Confidence	Status
Acute decompensated heart failure due to ischemic cardiomyopathy *Evidence: EF 25%, anterior wall akinesis, elevated BNP, S3 gallop*	I50.21	0.0%	Very Low	PRIMARY

Alternative & Minority Diagnoses

Diagnosis	ICD-10	Support	Type
Acute coronary syndrome *Evidence: prior MI history, chest symptoms, cardiac risk factors*	I24.9	3.7%	Minority (<10%)
Pulmonary embolism *Evidence: shortness of breath, acute presentation*	I26.99	3.7%	Minority (<10%)

Analysis Overview
Models Queried: 3
Successful Responses: 3
Consensus Level: High
Total Cost: <$0.01

Critical Decision Points & Evidence Synthesis

Critical Decision Points

Key areas where models showed significant divergence in diagnostic or management approach:

Evidence Synthesis & Clinical Correlation

Symptom-Diagnosis Correlation Matrix

Symptom	acute de	acute co	pulmonar
dyspnea on exer	Strong	-	-
orthopnea	Strong	-	-
paroxysmal noct	Strong	-	-
crackles	Strong	-	-
S3 gallop	Strong	-	-

Legend: +++ Strong association, ++ Moderate, + Weak, - Not typical

Diagnostic Decision Tree

Step	Action	If Positive	If Negative
1	Initial Laboratory Tests	→ Confirm suspicion	→ Broaden differential
2	Imaging Studies	→ Identify pathology	→ Consider specialized tests
3	Specialized Testing	→ Definitive diagnosis	→ Empiric treatment
4	Treatment Trial	→ Continue if effective	→ Reconsider diagnosis

Executive Summary

Case Description

A 68-year-old man with a history of long-standing hypertension, poorly controlled type 2 diabetes mellitus, and prior anterior myocardial infarction presents with progressive exertional dyspnea, orthopnea, and paroxysmal nocturnal dyspnea over the past two weeks. On examination, he is tachycardic and hypertensive, with jugular venous distension, bibasilar crackles, and an S3 gallop. ECG shows sinus tachycardia with Q waves in leads V1–V4, and transthoracic echocardiography reveals a left ventricular ejection fraction of 25% with akinesis of the anterior wall and moderate functional mitral regurgitation. Laboratory studies demonstrate elevated BNP and mild renal impairment. He is admitted for acute decompensated heart failure on a background of ischemic cardiomyopathy, with consideration for optimization of guideline-directed medical therapy, management of volume overload, and evaluation for device therapy.

Key Clinical Findings

Primary Recommendations

• Consider Acute decompensated heart failure due to ischemic cardiomyopathy among differential diagnoses

• Obtain Chest X-ray to assess pulmonary edema for diagnostic confirmation

Primary Diagnosis Clinical Summaries

■ Key Clinical Findings

Finding	Supporting Evidence	Clinical Reasoning
EF 25%	Clinical presentation	Key diagnostic indicator
anterior wall akinesis	Clinical presentation	Key diagnostic indicator
elevated BNP	Clinical presentation	Key diagnostic indicator
S3 gallop	Clinical presentation	Key diagnostic indicator
crackles	Clinical presentation	Key diagnostic indicator

■ Recommended Tests

Test Name	Type	Priority	Rationale
Chest X-ray to assess pulmonary edema	Laboratory	Urgent	Diagnostic confirmation
Complete metabolic panel including creatinine and electrolytes	Laboratory	Urgent	Diagnostic confirmation
BNP or NT-proBNP levels	Laboratory	Urgent	Diagnostic confirmation
Arterial blood gas if respiratory distress	Laboratory	Urgent	Diagnostic confirmation
Echocardiogram to assess current EF and wall motion	Laboratory	Urgent	Diagnostic confirmation

■ Immediate Management

Intervention	Category	Urgency	Clinical Reasoning
Assess hemodynamic stability and volume status	Medical	Immediate	Critical intervention
Obtain IV access and continuous cardiac monitoring	Medical	Immediate	Critical intervention
Position patient upright to reduce preload	Medical	Immediate	Critical intervention
Administer supplemental oxygen if SpO2 <90%	Medical	Immediate	Critical intervention

Intervention	Category	Urgency	Clinical Reasoning
Strict I/O monitoring and daily weights	Medical	Immediate	Critical intervention

■ Medications

Medication	Dosage	Route/Frequency	Indication
Furosemide	40-80mg	IV / BID or continuous infusion	Volume overload and pulmonary congestion
Lisinopril or Enalapril	2.5-5mg	PO / Daily	ACE inhibitor for heart failure with reduced EF
Metoprolol succinate	25mg	PO / BID	Beta-blocker for ischemic cardiomyopathy
Atorvastatin	40mg	PO / Daily	Secondary prevention for ischemic heart disease

Diagnostic Landscape Analysis

Detailed Diagnostic Analysis

The ensemble analysis identified **Acute decompensated heart failure due to ischemic cardiomyopathy** as the primary diagnosis with limited consensus among 1 models.

Detailed Alternative Analysis

Diagnosis	Support	Key Evidence	Clinical Significance
Acute coronary syndrome *Evidence: prior MI history, chest symptoms, cardiac risk factors*	3.7%	1 models	Unlikely
Pulmonary embolism *Evidence: shortness of breath, acute presentation*	3.7%	1 models	Unlikely

Minority Opinions

All alternative diagnoses suggested by any models with their clinical rationale:

- **Acute coronary syndrome** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: model1
- **Pulmonary embolism** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: model1

Additional Diagnoses Considered:

Management Strategies & Clinical Pathways

Immediate Actions Required

Priority	Action	Rationale	Consensus
1	Assess hemodynamic stability and volume status	Clinical indication	50%
2	Obtain IV access and continuous cardiac monitoring	Clinical indication	50%
3	Position patient upright to reduce preload	Clinical indication	50%
4	Administer supplemental oxygen if SpO2 <90%	Clinical indication	50%
5	Strict I/O monitoring and daily weights	Clinical indication	50%

Recommended Diagnostic Tests

Test	Purpose	Priority	Timing
Chest X-ray to assess pulmonary edema	Diagnostic confirmation	Routine	As indicated
Complete metabolic panel including creatinine and electrolytes	Diagnostic confirmation	Routine	As indicated
BNP or NT-proBNP levels	Diagnostic confirmation	Routine	As indicated
Arterial blood gas if respiratory distress	Diagnostic confirmation	Routine	As indicated
Echocardiogram to assess current EF and wall motion	Diagnostic confirmation	Routine	As indicated
12-lead ECG to rule out acute ischemia	Diagnostic confirmation	Routine	As indicated

Treatment Recommendations

Treatment recommendations pending diagnostic confirmation.

Model Diversity & Bias Analysis

Model Response Overview & Cost Analysis

Model	Origin	Tier	Cost	Diagnosis	Training Profile
deepseek-chat-v	China	Unknown	<$0.01	Acute decompensated heart failure due to ischemic cardiomyopathy	General
deepseek-r1	China	Unknown	<$0.01	Acute decompensated heart failure due to ischemic cardiomyopathy	General
gemma-2-9b-it	USA	Free	Free	Acute Decompensated Heart Failure	General

Total Estimated Cost: <$0.01

Understanding Training Profiles

Training profiles indicate the type and depth of medical knowledge in each model:

Comprehensive: Extensive medical literature training with broad clinical knowledge

Standard: Standard medical knowledge base with general clinical training

Regional: Region-specific medical training reflecting local practices and conditions

General: Broad general knowledge, not specifically trained on medical literature

Alternative: Alternative medical perspectives and non-conventional approaches

AI Model Bias Analysis

AI model bias analysis is generated during orchestration (Step 2). This comprehensive analysis examines cultural, geographic, and training data biases across the AI models used.

Detailed Model Responses

Complete diagnostic assessments from each model:

1. deepseek-chat-v (China, Released: 2024-12-26)

Primary Diagnosis: Acute decompensated heart failure due to ischemic cardiomyopathy (ICD-10: I50.21) - Confidence: 0.95

Differential Diagnoses:

- Acute coronary syndrome (ICD: I24.9) - 0.4
- Pulmonary embolism (ICD: I26.99) - 0.3
- Chronic obstructive pulmonary disease exacerbation (ICD: J44.1) - 0.25

Key Clinical Findings:

- Progressive exertional dyspnea, orthopnea, PND
- Tachycardia, hypertension, JVD
- Bibasilar crackles, S3 gallop
- ECG: sinus tachycardia with anterior Q waves

2. deepseek-r1 (China, Released: 2025-01-20)

3. gemma-2-9b-it (USA, Released: 2024-06-27)