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: Both models agree on heart failure diagnosis, High confidence level (0.95) from both models, Ischemic cardiomyopathy as underlying cause*	I50.1	0.0%	Very Low	PRIMARY

Alternative & Minority Diagnoses

Diagnosis	ICD-10	Support	Type
Acute Coronary Syndrome *Evidence: Model 1 includes ACS with 0.4 confidence*	I24.9	3.7%	Minority (<10%)
Pulmonary Embolism *Evidence: Model 1 includes PE with 0.2 confidence*	I26.99	3.7%	Minority (<10%)
Pulmonary Hypertension *Evidence: Model 2 includes pulmonary hypertension with 0.6 confidence*	I26.9	3.7%	Minority (<10%)
Atrial Fibrillation *Evidence: Model 2 includes arrhythmia/atrial fibrillation with 0.5 confidence*	I48.9	3.7%	Minority (<10%)
Chronic Obstructive Pulmonary Disease *Evidence: Not mentioned in provided responses*	J44.9	0.0%	Minority (<10%)
Pneumonia *Evidence: Not mentioned in provided responses*	J18.9	0.0%	Minority (<10%)
Cardiac Tamponade *Evidence: Not mentioned in provided responses*	I31.4	0.0%	Minority (<10%)
Aortic Stenosis *Evidence: Not mentioned in provided responses*	I35.0	0.0%	Minority (<10%)
Myocarditis *Evidence: Not mentioned in provided responses*	I40.9	0.0%	Minority (<10%)

Diagnosis	ICD-10	Support	Type
Renal Failure *Evidence: Not mentioned in provided responses*	N19	0.0%	Minority (<10%)

Analysis Overview
Models Queried: 2
Successful Responses: 2
Consensus Level: High
Total Estimated 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	Heart Fa	ACS	Pulmonar	Pulmonar	Atrial F
Dyspnea	Strong	-	Medium	Strong	-
Chest pain	Medium	Strong	-	-	-
Fatigue	Strong	-	-	-	-
Edema	Strong	-	-	-	-
Palpitations	Medium	-	-	-	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

• Assess ABCs (Airway, Breathing, Circulation)

• Administer supplemental oxygen to maintain SpO2 >90%

• Obtain IV access

• Obtain ECG for diagnostic confirmation

Primary Diagnosis Clinical Summaries

■ Key Clinical Findings

Finding	Supporting Evidence	Clinical Reasoning
Heart failure diagnosis	Clinical presentation	Key diagnostic indicator
Ischemic cardiomyopathy	Clinical presentation	Key diagnostic indicator
High diagnostic confidence	Clinical presentation	Key diagnostic indicator
Cardiac-related differentials	Clinical presentation	Key diagnostic indicator
Pulmonary involvement considered	Clinical presentation	Key diagnostic indicator

■ Recommended Tests

Test Name	Type	Priority	Rationale
ECG	Laboratory	Urgent	Diagnostic confirmation
Chest X-ray	Laboratory	Urgent	Diagnostic confirmation
Echocardiogram	Laboratory	Urgent	Diagnostic confirmation
BNP/NT-proBNP	Laboratory	Urgent	Diagnostic confirmation
Troponin	Laboratory	Urgent	Diagnostic confirmation

■ Immediate Management

Intervention	Category	Urgency	Clinical Reasoning
Assess ABCs (Airway, Breathing, Circulation)	Medical	Immediate	Critical intervention
Administer supplemental oxygen to maintain SpO2 >90%	Medical	Immediate	Critical intervention
Obtain IV access	Medical	Immediate	Critical intervention
Initiate cardiac monitoring	Medical	Immediate	Critical intervention
Position patient upright if tolerated	Medical	Immediate	Critical intervention

■ Medications

Medication	Dosage	Route/Frequency	Indication
Furosemide	20-40 mg	IV / Once, then reassess	Diuresis for volume overload
Nitroglycerin	10-20 mcg/min	IV infusion / Continuous	Afterload reduction and preload reduction

Diagnostic Landscape Analysis

Detailed Diagnostic Analysis

The ensemble analysis identified **Acute Decompensated Heart Failure due to Ischemic Cardiomyopathy** as the primary diagnosis with 0.0% consensus among 1 models.

Detailed Alternative Analysis

Diagnosis	Support	Key Evidence	Clinical Significance
Acute Coronary Syndrome *Evidence: Model 1 includes ACS with 0.4 confidence*	3.7%	1 models	Unlikely
Pulmonary Embolism *Evidence: Model 1 includes PE with 0.2 confidence*	3.7%	1 models	Unlikely
Pulmonary Hypertension *Evidence: Model 2 includes pulmonary hypertension with 0.6 confidence*	3.7%	1 models	Unlikely
Atrial Fibrillation *Evidence: Model 2 includes arrhythmia/atrial fibrillation with 0.5 confidence*	3.7%	1 models	Unlikely
Chronic Obstructive Pulmonary Disease *Evidence: Not mentioned in provided responses*	0.0%	0 models	Unlikely
Pneumonia *Evidence: Not mentioned in provided responses*	0.0%	0 models	Unlikely
Cardiac Tamponade *Evidence: Not mentioned in provided responses*	0.0%	0 models	Unlikely
Aortic Stenosis *Evidence: Not mentioned in provided responses*	0.0%	0 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: Unknown

• **Pulmonary Embolism** (ICD-10: Unknown) - 3.7% agreement (1 models)

    Supporting Models: Unknown

• **Pulmonary Hypertension** (ICD-10: Unknown) - 3.7% agreement (1 models)

    Supporting Models: Unknown

• **Atrial Fibrillation** (ICD-10: Unknown) - 3.7% agreement (1 models)

    Supporting Models: Unknown

• **Chronic Obstructive Pulmonary Disease** (ICD-10: Unknown) - 0.0% agreement (0 models)

    Supporting Models:

• **Pneumonia** (ICD-10: Unknown) - 0.0% agreement (0 models)

    Supporting Models:

• **Cardiac Tamponade** (ICD-10: Unknown) - 0.0% agreement (0 models)

    Supporting Models:

• **Aortic Stenosis** (ICD-10: Unknown) - 0.0% agreement (0 models)

    Supporting Models:

• **Myocarditis** (ICD-10: Unknown) - 0.0% agreement (0 models)

    Supporting Models:

• **Renal Failure** (ICD-10: Unknown) - 0.0% agreement (0 models)

    Supporting Models:

Additional Diagnoses Considered:

Management Strategies & Clinical Pathways

Immediate Actions Required

Priority	Action	Rationale	Consensus
1	Assess ABCs (Airway, Breathing, Circulation)	Clinical indication	50%
2	Administer supplemental oxygen to maintain SpO2 >90%	Clinical indication	50%
3	Obtain IV access	Clinical indication	50%
4	Initiate cardiac monitoring	Clinical indication	50%
5	Position patient upright if tolerated	Clinical indication	50%

Recommended Diagnostic Tests

Test	Purpose	Priority	Timing
ECG	Diagnostic confirmation	Routine	As indicated
Chest X-ray	Diagnostic confirmation	Routine	As indicated
Echocardiogram	Diagnostic confirmation	Routine	As indicated
BNP/NT-proBNP	Diagnostic confirmation	Routine	As indicated
Troponin	Diagnostic confirmation	Routine	As indicated
Complete metabolic panel	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
gemma-3-12b-it	USA	Unknown	<$0.01	Acute Decompensated Heart Failure secondary to Ischemic Cardiomyopathy	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: I50.1) - Confidence: 0.95

Differential Diagnoses:

- Acute coronary syndrome (ICD: I24.9) - 0.4
- Pulmonary embolism (ICD: I26.99) - 0.2
- Chronic obstructive pulmonary disease exacerbation (ICD: J44.1) - 0.15

Key Clinical Findings:

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

2. gemma-3-12b-it (USA, Released: 2024-12-11)

Primary Diagnosis: Acute Decompensated Heart Failure secondary to Ischemic Cardiomyopathy (ICD-10: I50.9) - Confidence: 0.95

Differential Diagnoses:

- Pulmonary Hypertension (ICD: I26.9) - 0.6
- Arrhythmia (Atrial Fibrillation) (ICD: I48.9) - 0.5
- Chronic Kidney Disease (ICD: N18.9) - 0.7

Key Clinical Findings:

- Progressive exertional dyspnea
- Orthopnea
- Paroxysmal nocturnal dyspnea
- Tachycardia