MEDLEY

Medical AI Ensemble Clinical Decision Report

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Primary Diagnostic Consensus

Diagnosis	ICD-10	Agreement	Confidence	Status
Acute decompensated heart failure *Evidence: Progressive exertional dyspnea, Orthopnea and PND, JVD and bibasilar crackles, S3 gallop*	I50.21	0.0%	Very Low	PRIMARY

Alternative & Minority Diagnoses

Diagnosis	ICD-10	Support	Type
Acute coronary syndrome *Evidence: Prior anterior MI, ECG showing Q waves in V1-V4, History of ischemic cardiomyopathy*	I21.4	7.4%	Minority (<10%)
Hypertensive emergency with heart failure *Evidence: Hypertension history, Currently hypertensive on exam*	I11.0	3.7%	Minority (<10%)
Pulmonary embolism *Evidence: Acute dyspnea, Tachycardia*	I26.0	3.7%	Minority (<10%)
Cardiac tamponade *Evidence: JVD, Dyspnea*	I31.3	3.7%	Minority (<10%)
Atrial fibrillation *Evidence: Tachycardia, History of heart disease*	I48.0	3.7%	Minority (<10%)
Chronic kidney disease exacerbation *Evidence: Mild renal impairment on labs*	N18.9	3.7%	Minority (<10%)
Pneumonia *Evidence: Bibasilar crackles, Fever potential*	J18.9	3.7%	Minority (<10%)
COPD exacerbation *Evidence: Exertional dyspnea, Crackles*	J44.1	3.7%	Minority (<10%)
Diabetic ketoacidosis *Evidence: Poorly controlled diabetes*	E10.10	3.7%	Minority (<10%)
Valvular heart disease *Evidence: Moderate functional mitral regurgitation*	I35.0	3.7%	Minority (<10%)

Analysis Overview

Models Queried: 3

Successful Responses: 3

Consensus Level: High

Total Cost: <$0.01

■■ Free Model Disclaimer: This analysis was generated using free AI models

Free models may provide suboptimal results. For improved accuracy and reliability, consider using premium models with an API key.

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	Hyperten	Pulmonar	Cardiac	Atrial f	COPD exa	Pneumoni
Exertional dysp	Strong	-	-	-	-	-	-	-
Orthopnea/PND	Strong	-	-	-	-	-	-	-
JVD	Strong	-	-	-	-	-	-	-
Bibasilar crack	Strong	-	-	-	-	-	-	-
S3 gallop	Strong	-	-	-	-	-	-	-
Tachycardia	-	-	-	Weak	-	-	-	-
Hypertension	-	-	Medium	-	-	-	-	-
ECG abnormaliti	-	Medium	-	-	-	-	-	-
Elevated BNP	Strong	-	-	-	-	-	-	-
Renal impairmen	-	-	-	-	-	-	-	-

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

• Recurrent fever episodes

Primary Recommendations

• Consider Acute decompensated heart failure among differential diagnoses
• Obtain BNP/NT-proBNP for diagnostic confirmation

Primary Diagnosis Clinical Summaries

■ Key Clinical Findings

Finding	Supporting Evidence	Clinical Reasoning
Progressive exertional dyspnea	Clinical presentation	Key diagnostic indicator
Orthopnea and PND	Clinical presentation	Key diagnostic indicator
JVD and bibasilar crackles	Clinical presentation	Key diagnostic indicator
S3 gallop	Clinical presentation	Key diagnostic indicator
Elevated BNP	Clinical presentation	Key diagnostic indicator

■ Recommended Tests

Test Name	Type	Priority	Rationale
BNP/NT-proBNP	Laboratory	Urgent	Diagnostic confirmation
Troponin	Laboratory	Urgent	Diagnostic confirmation
Complete metabolic panel (electrolytes, renal function)	Laboratory	Urgent	Diagnostic confirmation
CBC	Laboratory	Urgent	Diagnostic confirmation
Chest X-ray	Laboratory	Urgent	Diagnostic confirmation

■ Immediate Management

Intervention	Category	Urgency	Clinical Reasoning
Assess airway, breathing, circulation	Medical	Immediate	Critical intervention
Administer supplemental oxygen to maintain SpO2 >90%	Medical	Immediate	Critical intervention
Establish IV access	Medical	Immediate	Critical intervention
Obtain 12-lead ECG	Medical	Immediate	Critical intervention
Initiate continuous cardiac monitoring	Medical	Immediate	Critical intervention

■ Medications

Medication	Dosage	Route/Frequency	Indication
Furosemide	20-40 mg	IV / Every 6-12 hours as needed	Diuresis for volume overload
Nitroglycerin	10-20 mcg/min	IV infusion / Continuous	Afterload reduction in hypertensive heart failure
Morphine sulfate	2-4 mg	IV / Every 5-15 minutes as needed	Anxiety and dyspnea relief (use with caution)

Diagnostic Landscape Analysis

Detailed Diagnostic Analysis

The ensemble analysis identified **Acute decompensated heart failure** as the primary diagnosis with limited consensus among 3 models.

Detailed Alternative Analysis

Diagnosis	Support	Key Evidence	Clinical Significance
Acute coronary syndrome *Evidence: Prior anterior MI, ECG showing Q waves in V1-V4, History of ischemic cardiomyopathy*	7.4%	2 models	Unlikely
Hypertensive emergency with heart failure *Evidence: Hypertension history, Currently hypertensive on exam*	3.7%	1 models	Unlikely
Pulmonary embolism *Evidence: Acute dyspnea, Tachycardia*	3.7%	1 models	Unlikely
Cardiac tamponade *Evidence: JVD, Dyspnea*	3.7%	1 models	Unlikely
Atrial fibrillation *Evidence: Tachycardia, History of heart disease*	3.7%	1 models	Unlikely
Chronic kidney disease exacerbation *Evidence: Mild renal impairment on labs*	3.7%	1 models	Unlikely
Pneumonia *Evidence: Bibasilar crackles, Fever potential*	3.7%	1 models	Unlikely
COPD exacerbation *Evidence: Exertional dyspnea, Crackles*	3.7%	1 models	Unlikely

Minority Opinions

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

- **Acute coronary syndrome** (ICD-10: Unknown) - 7.4% agreement (2 models)
  Supporting Models: Model1, Model3
- **Hypertensive emergency with heart failure** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model1
- **Pulmonary embolism** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model3
- **Cardiac tamponade** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model3

- **Atrial fibrillation** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model3
- **Chronic kidney disease exacerbation** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model2
- **Pneumonia** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model2
- **COPD exacerbation** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model2
- **Diabetic ketoacidosis** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model2
- **Valvular heart disease** (ICD-10: Unknown) - 3.7% agreement (1 models)
  Supporting Models: Model2

Additional Diagnoses Considered:

Management Strategies & Clinical Pathways

Immediate Actions Required

Priority	Action	Rationale	Consensus
1	Assess airway, breathing, circulation	Clinical indication	50%
2	Administer supplemental oxygen to maintain SpO2 >90%	Clinical indication	50%
3	Establish IV access	Clinical indication	50%
4	Obtain 12-lead ECG	Clinical indication	50%
5	Initiate continuous cardiac monitoring	Clinical indication	50%

Recommended Diagnostic Tests

Test	Purpose	Priority	Timing
BNP/NT-proBNP	Diagnostic confirmation	Routine	As indicated
Troponin	Diagnostic confirmation	Routine	As indicated
Complete metabolic panel (electrolytes, renal function)	Diagnostic confirmation	Routine	As indicated
CBC	Diagnostic confirmation	Routine	As indicated
Chest X-ray	Diagnostic confirmation	Routine	As indicated
Arterial blood gas if hypoxic	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
shisa-v2-llama3	Japan/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: I50.23) - Confidence: 0.95

Differential Diagnoses:

- Acute coronary syndrome (ICD: I24.9) - 0.4
- Hypertensive emergency with heart failure (ICD: I11.0) - 0.35
- Diabetic cardiomyopathy with acute decompensation (ICD: E11.9) - 0.3

Key Clinical Findings:

- Progressive exertional dyspnea, orthopnea, PND
- Tachycardia, hypertension, JVD, bibasilar crackles, S3 gallop
- ECG showing sinus tachycardia with anterior Q waves
- Echo showing LVEF 25% with anterior wall akinesis and moderate MR

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

3. shisa-v2-llama3 (Japan/USA, Released: 2024-12-20)

Primary Diagnosis: Acute decompensated heart failure (ICD-10: I50.21) - Confidence: 0.9

Differential Diagnoses:

- Acute coronary syndrome (ICD: I21.4) - 0.3
- Pulmonary embolism (ICD: I26.0) - 0.2
- Cardiac tamponade (ICD: I31.3) - 0.1

Key Clinical Findings:

- Progressive dyspnea
- Orthopnea
- Paroxysmal nocturnal dyspnea
- Jugular venous distension