MEDLEY

Medical AI Ensemble Clinical Decision Report

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Primary Diagnostic Consensus

Diagnosis	ICD-10	Agreement	Confidence	Status
Familial Mediterranean Fever (FMF) *Evidence: Mediterranean descent, Recurrent fever episodes lasting 1-3 days, Family history in father and uncle, Elevated inflammatory markers during attacks*	E85.0	0.0%	Very Low	PRIMARY

Alternative & Minority Diagnoses

Diagnosis	ICD-10	Support	Type
Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis (PFAPA) Syndrome *Evidence: Recurrent fever episodes, Childhood onset*	M89.1	3.7%	Minority (<10%)
Hyper-IgD Syndrome (Mevalonate Kinase Deficiency) *Evidence: Recurrent fever episodes, Abdominal pain, Joint pain*	E88.89	3.7%	Minority (<10%)
Systemic Autoinflammatory Disorder *Evidence: Recurrent inflammatory episodes, Elevated acute phase reactants*	M35.9	3.7%	Minority (<10%)
TNF Receptor Associated Periodic Syndrome (TRAPS) *Evidence: Recurrent fever, Chest pain, Abdominal pain*	M04.2	0.0%	Minority (<10%)
Cryopyrin-Associated Periodic Syndromes (CAPS) *Evidence: Recurrent fever, Joint pain*	M04.2	0.0%	Minority (<10%)
Behçet's Disease *Evidence: Mediterranean descent, Recurrent episodes*	M35.2	0.0%	Minority (<10%)

Diagnosis	ICD-10	Support	Type
Adult-onset Still's Disease *Evidence: Recurrent fever, Joint pain, Elevated inflammatory markers*	M06.1	0.0%	Minority (<10%)
Systemic Lupus Erythematosus *Evidence: Joint pain, Elevated inflammatory markers*	M32.9	0.0%	Minority (<10%)
Inflammatory Bowel Disease *Evidence: Abdominal pain, Elevated inflammatory markers*	K50.9	0.0%	Minority (<10%)
Periodic Fever Syndrome, Unspecified *Evidence: Recurrent fever episodes, Periodic nature*	R50.9	0.0%	Minority (<10%)

Analysis Overview

Models Queried: 5

Successful Responses: 5

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	FMF	PFAPA Sy	Hyper-Ig
recurrent fever	Strong	Medium	Medium
abdominal pain	Strong	-	-
chest pain	Medium	-	-
joint pain	Medium	-	-
family history	Strong	-	-
Mediterranean d	Strong	-	-

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

Diagnostic Decision Tree

Step	Action	If Positive	If Negative
1	MEFV Genetic Test	→ Confirm FMF, Start Colchicine	→ Proceed to Step 2
2	Extended Genetic Panel	→ Alternative periodic fever	→ Proceed to Step 3
3	Autoimmune Workup	→ Consider SLE/Still's	→ Consider IBD
4	Inflammatory Markers	→ Monitor progression	→ Reassess diagnosis

Executive Summary

Case Description

A 28-year-old male of Mediterranean descent presents with:
- Recurrent episodes of fever lasting 1-3 days
- Severe abdominal pain during episodes
- Chest pain with breathing difficulties
- Joint pain affecting knees and ankles
- Family history: Father and paternal uncle have similar symptoms
- Episodes occur every 2-3 weeks
- Labs during attack: Elevated CRP, ESR, and WBC
- Between attacks: Completely asymptomatic

Patient reports episodes started in childhood around age 7. Recent genetic testing is pending.

Key Clinical Findings

• Recurrent fever episodes
• Positive family history of similar episodes
• Severe abdominal pain with peritoneal signs
• Migratory arthritis affecting large joints
• Elevated inflammatory markers (CRP, ESR)

Primary Recommendations

• Consider Familial Mediterranean Fever (FMF) among differential diagnoses
• Confirm FMF diagnosis with genetic testing for MEFV gene mutations
• Assess current disease activity and attack frequency
• Evaluate for amyloidosis complications
• Obtain MEFV gene mutation analysis for diagnostic confirmation

Primary Diagnosis Clinical Summaries

■ Key Clinical Findings

Finding	Supporting Evidence	Clinical Reasoning
Mediterranean descent	Clinical presentation	Key diagnostic indicator
Recurrent fever episodes lasting 1-3 days	Clinical presentation	Key diagnostic indicator
Episodes occur every 2-3 weeks	Clinical presentation	Key diagnostic indicator
Family history in father and uncle	Clinical presentation	Key diagnostic indicator
Childhood onset	Clinical presentation	Key diagnostic indicator

■ Recommended Tests

Test Name	Type	Priority	Rationale
MEFV gene mutation analysis	Laboratory	Urgent	Diagnostic confirmation
24-hour urine protein to screen for amyloidosis	Laboratory	Urgent	Diagnostic confirmation
Serum amyloid A (SAA) levels	Laboratory	Urgent	Diagnostic confirmation
Comprehensive metabolic panel including creatinine	Laboratory	Urgent	Diagnostic confirmation

■ Immediate Management

Intervention	Category	Urgency	Clinical Reasoning
Confirm FMF diagnosis with genetic testing for MEFV gene mutations	Medical	Immediate	Critical intervention
Assess current disease activity and attack frequency	Medical	Immediate	Critical intervention
Evaluate for amyloidosis complications	Medical	Immediate	Critical intervention
Patient education on FMF and attack management	Medical	Immediate	Critical intervention

■ Medications

Medication	Dosage	Route/Frequency	Indication
Colchicine	0.6 mg	oral / twice daily	prevention of FMF attacks and amyloidosis
Anakinra	100 mg	subcutaneous / daily	refractory FMF attacks

Diagnostic Landscape Analysis

Detailed Diagnostic Analysis

The ensemble analysis identified **Familial Mediterranean Fever (FMF)** as the primary diagnosis with 0.0% consensus among 2 models.

Detailed Alternative Analysis

Diagnosis	Support	Key Evidence	Clinical Significance
Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis (PFAPA) Syndrome *Evidence: Recurrent fever episodes, Childhood onset*	3.7%	1 models	Unlikely
Hyper-IgD Syndrome (Mevalonate Kinase Deficiency) *Evidence: Recurrent fever episodes, Abdominal pain, Joint pain*	3.7%	1 models	Unlikely
Systemic Autoinflammatory Disorder *Evidence: Recurrent inflammatory episodes, Elevated acute phase reactants*	3.7%	1 models	Unlikely
TNF Receptor Associated Periodic Syndrome (TRAPS) *Evidence: Recurrent fever, Chest pain, Abdominal pain*	0.0%	0 models	Unlikely
Cryopyrin-Associated Periodic Syndromes (CAPS) *Evidence: Recurrent fever, Joint pain*	0.0%	0 models	Unlikely
Behçet's Disease *Evidence: Mediterranean descent, Recurrent episodes*	0.0%	0 models	Unlikely
Adult-onset Still's Disease *Evidence: Recurrent fever, Joint pain, Elevated inflammatory markers*	0.0%	0 models	Unlikely
Systemic Lupus Erythematosus *Evidence: Joint pain, Elevated inflammatory markers*	0.0%	0 models	Unlikely

Minority Opinions

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

• **Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis (PFAPA) Syndrome** (ICD-10: R50.9) - 3.7% agreement (1 models)

Supporting Models: model5

• **Hyper-IgD Syndrome (Mevalonate Kinase Deficiency)** (ICD-10: Unknown) - 3.7% agreement (1 models)

Supporting Models: model5

• **Systemic Autoinflammatory Disorder** (ICD-10: Unknown) - 3.7% agreement (1 models)

Supporting Models: model4

• **TNF Receptor Associated Periodic Syndrome (TRAPS)** (ICD-10: Unknown) - 0.0% agreement (0 models)

Supporting Models:

• **Cryopyrin-Associated Periodic Syndromes (CAPS)** (ICD-10: Unknown) - 0.0% agreement (0 models)

Supporting Models:

• **Behçet's Disease** (ICD-10: Unknown) - 0.0% agreement (0 models)

Supporting Models:

• **Adult-onset Still's Disease** (ICD-10: Unknown) - 0.0% agreement (0 models)

Supporting Models:

• **Systemic Lupus Erythematosus** (ICD-10: M32.9) - 0.0% agreement (0 models)

Supporting Models:

• **Inflammatory Bowel Disease** (ICD-10: K50.9) - 0.0% agreement (0 models)

Supporting Models:

• **Periodic Fever Syndrome, Unspecified** (ICD-10: R50.9) - 0.0% agreement (0 models)

Supporting Models:

Additional Diagnoses Considered:

Management Strategies & Clinical Pathways

Immediate Actions Required

Priority	Action	Rationale	Consensus
1	Confirm FMF diagnosis with genetic testing for MEFV gene mutations	Clinical indication	50%
2	Assess current disease activity and attack frequency	Clinical indication	50%
3	Evaluate for amyloidosis complications	Clinical indication	50%
4	Patient education on FMF and attack management	Clinical indication	50%

Recommended Diagnostic Tests

Test	Purpose	Priority	Timing
MEFV gene mutation analysis	Diagnostic confirmation	Routine	As indicated
24-hour urine protein to screen for amyloidosis	Diagnostic confirmation	Routine	As indicated
Serum amyloid A (SAA) levels	Diagnostic confirmation	Routine	As indicated
Comprehensive metabolic panel including creatinine	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-r1	China	Unknown	<$0.01	Familial Mediterranean Fever	General
gemma-2-9b-it	USA	Free	Free	and potential differential diagnoses (other possibilities)	General
llama-3.2-3b-in	USA	Free	Free	Reiter's Syndrome	General
mistral-7b-inst	France	Free	Free	Familial Mediterranean Fever	General
shisa-v2-llama3	Japan/USA	Free	Free	Familial Mediterranean Fever	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-r1 (China, Released: 2025-01-20)

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

3. llama-3.2-3b-in (USA, Released: 2024-09-25)

Primary Diagnosis: Reiter's Syndrome (ICD-10: L50.9) - Confidence: 0.8

Differential Diagnoses:

- Ankylosing Spondylitis (ICD: M45.1) - 0.4
- Spondyloarthritis (ICD: M91.9) - 0.6
- Seronegative Spondyloarthropathy (ICD: M45.0) - 0.3

Key Clinical Findings:

- Severe abdominal pain
- Elevated CRP, ESR, and WBC during attacks
- Chest pain with breathing difficulties during attacks

4. mistral-7b-inst (France, Released: 2023-09-27)

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

Primary Diagnosis: Familial Mediterranean Fever (FMF) (ICD-10: E85.0) - Confidence: 0.8

Differential Diagnoses:

- Periodic Fever, Aphthous Stomatitis, Pharyngitis, Adenitis (PFAPA) Syndrome (ICD: M89.1) - 0.3
- Hyper-IgD Syndrome (Mevalonate Kinase Deficiency) (ICD: E85.8) - 0.2
- TNF Receptor-Associated Periodic Syndrome (TRAPS) (ICD: M89.2) - 0.2

Key Clinical Findings:

- Recurrent fever episodes
- Severe abdominal and chest pain
- Joint pain
- Family history of similar symptoms