

# MEDLEY

## Medical AI Ensemble Clinical Decision Report

Case ID: Case_13	Title: Case_13 - Medical Analysis	Generated: 2025-08-12 00:43
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### Primary Diagnostic Consensus

Diagnosis	ICD-10	Agreement	Confidence	Status
No consensus reached	M32.14	0.0%	Very Low	PRIMARY

Analysis Overview
Models Queried: 22
Successful Responses: 22
Consensus Level: Unknown
Total Estimated Cost: \$0.385

# 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

## 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

Complex Urology Case Presentation

Patient Demographics

Age: 24 years old

Sex: Male

Ethnicity: Middle Eastern (Iranian heritage)

Occupation: Graduate student in chemistry

Chief Complaint

"Burning when I urinate and blood in my urine for the past 6 months, on and off"

History of Present Illness

24-year-old male presents with a 6-month history of intermittent dysuria, gross hematuria, and suprapubic discomfort. Episodes occur every 2-3 weeks, last 3-5 days, then resolve completely. Patient reports no fever during episodes. Pain is described as "deep burning" both during and after urination. Has had 4 courses of antibiotics from urgent care with temporary improvement each time.

Recently developed new symptoms: bilateral flank pain, decreased urine output, and weight gain of 8 lbs over 2 weeks. Denies recent travel, new sexual partners, or illicit drug use. Reports family history of "kidney problems" in paternal uncle.

Past Medical History

- Recurrent "kidney stones" as teenager (no documentation available)
- Treated for depression with sertraline 50mg daily for 2 years
- No known allergies

Social History

- PhD student in organic chemistry, works with various solvents and compounds
- Denies tobacco use
- Social alcohol use (2-3 drinks/week)
- Sexually active with one female partner for 8 months
- Recent immigrant (3 years ago), limited family medical records

Physical Examination

- Vital Signs: BP 145/92, HR 88, Temp 37.1°C, RR 16
- General: Mild periorbital edema, appears fatigued
- Genitourinary: No penile discharge, testes normal, mild suprapubic tenderness
- Costovertebral angle: Bilateral tenderness
- Extremities: 1+ pitting edema to mid-shins

Laboratory Results

Urinalysis (during symptomatic episode)

- Color: Dark amber with visible blood
- Protein: 3+ (300 mg/dL)
- Blood: 3+
- RBC: >50/hpf, many dysmorphic

- WBC: 15-20/hpf
- Nitrites: Negative
- Leukocyte esterase: 2+
- Casts: 3-5 RBC casts/lpf, 1-2 granular casts/lpf

#### Urine Culture

- Day 1: Mixed flora <10,000 CFU/mL
- Day 3: No growth

#### Serum Chemistry

- Creatinine: 2.1 mg/dL (baseline unknown)
- BUN: 45 mg/dL
- eGFR: 42 mL/min/1.73m<sup>2</sup>
- Sodium: 138 mEq/L
- Potassium: 4.8 mEq/L
- Chloride: 104 mEq/L

#### Additional Labs

- CBC: WBC 8,200, Hgb 11.2 g/dL, Plt 180,000
- ESR: 45 mm/hr
- CRP: 12 mg/L
- C3: 45 mg/dL (Low, normal 90-180)
- C4: 8 mg/dL (Low, normal 10-40)
- ANA: Positive, 1:160 homogeneous pattern
- Anti-dsDNA: Pending
- ANCA: Pending

#### Imaging

- Renal Ultrasound: Bilateral increased echogenicity, no hydronephrosis, no obvious stones
- CT Abdomen/Pelvis (non-contrast): Bilateral renal enlargement, no stones identified

## Key Clinical Findings

- Positive family history of similar episodes
- Elevated inflammatory markers (CRP, ESR)

## Primary Recommendations

- Consider Primary diagnosis among differential diagnoses
- Nephrology consultation
- Renal biopsy
- Complete autoimmune workup

## Primary Diagnosis Clinical Summaries

Orchestrated analysis not available for this case.

# Diagnostic Landscape Analysis

## Detailed Diagnostic Analysis

## Detailed Alternative Analysis

The model ensemble showed strong consensus on the primary diagnosis with limited alternative considerations.

## Minority Opinions

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

### Additional Diagnoses Considered:

- **Lupus Nephritis** (ICD-10: M32.14) - 18.2% (4 models)
- **IgA Nephropathy** (ICD-10: N02.8) - 13.6% (3 models)
- **Post-Infectious Glomerulonephritis** (ICD-10: N00.9) - 9.1% (2 models)
- **Membranoproliferative Glomerulonephritis** (ICD-10: N05.5) - 4.5% (1 models)
- **ANCA-associated Vasculitis** (ICD-10: M31.30) - 4.5% (1 models)
- **Chronic Kidney Disease** (ICD-10: N18.9) - 4.5% (1 models)
- **Recurrent Urinary Tract Infection** (ICD-10: N39.0) - 4.5% (1 models)

## Diagnostic Confidence Analysis

# Management Strategies & Clinical Pathways

## Immediate Actions Required

Priority	Action	Rationale	Consensus
1	Nephrology consultation	Glomerulonephritis requires specialist evaluation	50%
2	Renal biopsy	Definitive diagnosis of glomerular disease type	50%
3	Complete autoimmune workup	Rule out systemic lupus erythematosus	50%

## Recommended Diagnostic Tests

## Treatment Recommendations

Treatment recommendations pending diagnostic confirmation.

# Model Diversity & Bias Analysis

## Model Response Overview & Cost Analysis

Model	Origin	Tier	Cost	Diagnosis	Training Profile
mistral-7b-inst	France	Budget	<\$0.01	Renal Infection (Pyelonephritis)	General
grok-4	USA	Premium	\$0.039	Glomerulonephritis with lupus nephritis	Alternative
gpt-oss-120b	USA	Mid-Range	<\$0.01	Lupus nephritis (probable class III/IV)	Standard
command-r	Canada	Mid-Range	<\$0.01	Acute Pyelonephritis	Standard
deepseek-chat	China	Budget	<\$0.01	Lupus Nephritis	Regional
gemini-2.5-pro	USA	Premium	\$0.036	Not specified	General
deepseek-r1	China	Budget	<\$0.01	Not specified	Regional
sonar-deep-rese	USA	Premium	\$0.017	Lupus Nephritis	Standard
jamba-large-1.7	Israel	Premium	\$0.017	Lupus Nephritis	Standard
gemini-2.5-flas	USA	Budget	<\$0.01	Lupus Nephritis	General
mistral-large-2	France	Premium	\$0.022	IgA Nephropathy (Berger's Disease)	Standard
command-r-plus	Canada	Premium	\$0.028	Glomerulonephritis	Standard
wizardlm-2-8x22	USA	Mid-Range	<\$0.01	Rapidly Progressive Glomerulonephritis	Standard
grok-2-1212	USA	Premium	\$0.018	Lupus Nephritis	Standard
gemma-2-9b-it	USA	Budget	<\$0.01	Systemic Lupus Nephritis	Standard
gpt-4o	USA	Premium	\$0.028	IgA Nephropathy	Comprehensive
gemini-2.5-flas	USA	Budget	<\$0.01	Glomerulonephritis, likely related to autoimmune disease (e.g., Lupus Nephritis)	General
llama-3.2-3b-in	USA	Budget	<\$0.01	Systemic Lupus Erythematosus (SLE) with renal involvement	General
gpt-4o-mini	USA	Budget	<\$0.01	Glomerulonephritis	General
qwen-2.5-coder-	China	Mid-Range	<\$0.01	Acute Interstitial Nephritis with Hematuria	Regional
claude-3-opus-2	USA	Premium	\$0.158	Lupus nephritis	Comprehensive
lfm-40b	USA	Mid-Range	<\$0.01	Interstitial cystitis	Standard

\*\*Total Estimated Cost: \$0.385\*\*

## 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.

### Primary Diagnosis Bias Factors:

- Cultural: Models from 6 countries with Western dominance may miss cultural factors. Chinese models (18.2%) provide alternative perspective.
- Geographic: Western model dominance (109.1%) creates strong bias toward Western medical paradigms. High Western medical paradigm influence expected
- Training Data: English-dominant training data creates systematic bias against non-Western medical practices and symptom presentations.

### Alternative Diagnoses Bias:

- Missed: Traditional Medicine Conditions - Western model dominance may miss traditional medicine diagno...
- Missed: Socioeconomic-Related Conditions - Homeless status bias may cause dismissive attitudes and miss...

### Bias Mitigation Recommendations:

- Socioeconomic Bias: Consider cultural context in diagnosis interpretation
- Geographic/Cultural Bias: Incorporate diverse cultural perspectives in diagnosis

## Detailed Model Responses

Complete diagnostic assessments from each model:

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

**Primary Diagnosis:** Renal Infection (Pyelonephritis) (ICD-10: N10.90) - Confidence: 0.8

**Differential Diagnoses:**

- Renal Cell Carcinoma (ICD: C64.9) - 0.2
- Urolithiasis (Kidney Stones) (ICD: N13.9) - 0.15
- Glomerulonephritis (ICD: B80.9) - 0.1

**Key Clinical Findings:**

- Recurrent UTI episodes, gross hematuria, flank pain, decreased urine output, proteinuria, RBC casts in urine, elevated ESR, elevated CRP, positive ANA
- Bilateral renal enlargement on CT Abdomen/Pelvis, normal renal ultrasound

### 2. grok-4 (USA, Released: 2024-12-26)

### 3. gpt-oss-120b (USA, Released: 2025-08-05)

### 4. command-r (Canada, Released: 2024-03-11)

**Primary Diagnosis:** Acute Pyelonephritis (ICD-10: N10) - Confidence: 0.75

**Differential Diagnoses:**

- Interstitial Cystitis (ICD: N30.9) - 0.6
- Bladder Cancer (ICD: C67) - 0.4
- Renal Abscess (ICD: N14.9) - 0.3

**Key Clinical Findings:**

- Recurrent urinary tract infections with transient relief from antibiotics
- Bilateral flank pain, tenderness & renal enlargement
- Gross hematuria, dysuria, suprapubic discomfort
- Mild periorbital edema, elevated BP, pending ANCA & anti-dsDNA results

### 5. deepseek-chat (China, Released: 2024-12-20)

## 6. gemini-2.5-pro (USA, Released: 2024-12-19)

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

## 8. sonar-deep-rese (USA, Released: 2025-03-07)

## 9. jamba-large-1.7 (Israel, Released: 2025-07-01)

**Primary Diagnosis:** Lupus Nephritis (ICD-10: N02.2) - Confidence: 0.8

**Differential Diagnoses:**

- IgA Nephropathy (ICD: N02.0) - 0.6
- Membranous Nephropathy (ICD: N02.3) - 0.4
- Chronic Pyelonephritis (ICD: N11.9) - 0.3

**Key Clinical Findings:**

- Bilateral renal enlargement
- Dysmorphic RBCs in urinalysis
- Low C3 and C4
- Positive ANA

## 10. gemini-2.5-flas (USA, Released: 2024-12-19)

## 11. mistral-large-2 (France, Released: 2024-11-01)

**Primary Diagnosis:** IgA Nephropathy (Berger's Disease) (ICD-10: N08.0) - Confidence: 0.85

**Differential Diagnoses:**

- Lupus Nephritis (ICD: M32.14) - 0.7
- Post-infectious Glomerulonephritis (ICD: N05.9) - 0.6
- Membranoproliferative Glomerulonephritis (ICD: N01.7) - 0.55

**Key Clinical Findings:**

- Intermittent dysuria and gross hematuria
- Bilateral flank pain and suprapubic tenderness
- Decreased urine output and weight gain
- Proteinuria and hematuria with RBC casts

## 12. command-r-plus (Canada, Released: 2024-04-04)

**Primary Diagnosis:** Glomerulonephritis (ICD-10: N03.9) - Confidence: 0.7

**Differential Diagnoses:**

- Interstitial Nephritis (ICD: N16.1) - 0.6
- Nephrolithiasis (Kidney Stones) (ICD: N20.9) - 0.5
- Urinary Tract Infection (UTI) (ICD: N39.0) - 0.4

**Key Clinical Findings:**

- Gross hematuria
- Elevated creatinine and BUN
- Low C3 and C4 levels
- Positive ANA

## 13. wizardlm-2-8x22 (USA, Released: 2024-04-15)

**Primary Diagnosis:** Rapidly Progressive Glomerulonephritis (ICD-10: N02.0) - Confidence: 0.7

**Differential Diagnoses:**

- IgA Nephropathy (ICD: N03.2) - 0.5
- Lupus Nephritis (ICD: N05.1) - 0.6
- Post-infectious Glomerulonephritis (ICD: N05.9) - 0.4

**Key Clinical Findings:**

- Intermittent dysuria, gross hematuria, and suprapubic discomfort for 6 months
- New onset bilateral flank pain, decreased urine output, and weight gain
- Proteinuria (3+) and hematuria with dysmorphic RBCs and RBC casts on urinalysis
- Elevated serum creatinine and BUN with reduced eGFR

## 14. grok-2-1212 (USA, Released: 2024-12-12)

**Primary Diagnosis:** Lupus Nephritis (ICD-10: M32.14) - Confidence: 0.8

**Differential Diagnoses:**

- IgA Nephropathy (ICD: N02.8) - 0.6
- ANCA-Associated Vasculitis (ICD: M31.3) - 0.5
- Chronic Interstitial Nephritis (ICD: N11.9) - 0.4

**Key Clinical Findings:**

- Intermittent dysuria and gross hematuria for 6 months
- Bilateral flank pain, decreased urine output, and weight gain
- Elevated serum creatinine and BUN, low eGFR
- Urinalysis showing proteinuria, hematuria, and RBC casts

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

**Primary Diagnosis:** Systemic Lupus Nephritis (ICD-10: N17.0) - Confidence: 0.8

**Differential Diagnoses:**

- Acute Interstitial Nephritis (ICD: N17.9) - 0.15
- Renal Cell Carcinoma (ICD: C64.9) - 0.05
- Glomerulonephritis (Other) (ICD: N03.9) - 0.1

**Key Clinical Findings:**

- Gross hematuria
- Proteinuria
- Dysmorphic red blood cells on urinalysis
- Renal casts on urinalysis

## 16. gpt-4o (USA, Released: 2024-05-13)

**Primary Diagnosis:** IgA Nephropathy (ICD-10: N02.8) - Confidence: 0.8

**Differential Diagnoses:**

- Lupus Nephritis (ICD: M32.14) - 0.7
- Alport Syndrome (ICD: Q87.81) - 0.6
- Acute Glomerulonephritis (ICD: N00.9) - 0.5

**Key Clinical Findings:**

- Intermittent dysuria and gross hematuria
- Bilateral flank pain
- Decreased urine output
- Weight gain with 1+ pitting edema

## 17. gemini-2.5-flas (USA, Released: 2024-12-19)

**Primary Diagnosis:** Glomerulonephritis, likely related to autoimmune disease (e.g., Lupus Nephritis) (ICD-10: N08.5) - Confidence: 0.9

**Differential Diagnoses:**

- IgA Nephropathy (ICD: N02.8) - 0.7
- Post-infectious Glomerulonephritis (ICD: N08.0) - 0.5
- Alport Syndrome (ICD: Q87.81) - 0.6

**Key Clinical Findings:**

- 6-month history of intermittent dysuria, gross hematuria, suprapubic discomfort
- Recent development of bilateral flank pain, decreased urine output, 8 lbs weight gain
- Elevated BP (145/92)
- Mild periorbital edema, 1+ pitting edema to mid-shins

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

**Primary Diagnosis:** Systemic Lupus Erythematosus (SLE) with renal involvement (ICD-10: M32.0) - Confidence: 0.9

### Differential Diagnoses:

- Interstitial Nephritis (ICD: N17.0) - 0.6
- Glomerulonephritis (ICD: N05.0) - 0.5
- Chronic Pyelonephritis (ICD: N35.0) - 0.4

### Key Clinical Findings:

- Bilateral flank pain
- Decreased urine output
- Weight gain
- Dark amber urine with visible blood

## 19. gpt-4o-mini (USA, Released: 2024-07-18)

**Primary Diagnosis:** Glomerulonephritis (ICD-10: N00) - Confidence: 0.8

### Differential Diagnoses:

- Interstitial Nephritis (ICD: N10) - 0.7
- Renal Stones (ICD: N20) - 0.5
- Urinary Tract Infection (ICD: N39.0) - 0.4

### Key Clinical Findings:

- Intermittent dysuria and hematuria
- Bilateral flank pain
- Bilateral renal enlargement on imaging
- Low C3 and C4 levels

## 20. qwen-2.5-coder- (China, Released: 2024-11-12)

**Primary Diagnosis:** Acute Interstitial Nephritis with Hematuria (ICD-10: N17.2) - Confidence: 0.85

### Differential Diagnoses:

- Renal Cell Carcinoma (RCC) (ICD: C64.9) - 0.15
- IgA Nephropathy (ICD: N30.0) - 0.1
- Systemic Lupus Erythematosus (SLE) (ICD: M32.9) - 0.1

### Key Clinical Findings:

- Recurrent hematuria and dysuria for 6 months
- Bilateral flank pain, decreased urine output, and weight gain over 2 weeks
- Recent significant rise in creatinine and BUN

- Positive ANA with homogeneous pattern

## **21. claude-3-opus-2 (USA, Released: 2024-02-29)**

**Primary Diagnosis:** Lupus nephritis (ICD-10: M32.14) - Confidence: 0.8

**Differential Diagnoses:**

- Acute interstitial nephritis (ICD: N12) - 0.6
- IgA nephropathy (ICD: N02.8) - 0.5
- Granulomatosis with polyangiitis (ICD: M31.3) - 0.4

**Key Clinical Findings:**

- Recurrent dysuria, hematuria, and suprapubic discomfort
- Bilateral flank pain and decreased urine output
- Proteinuria, dysmorphic RBCs, and RBC casts on urinalysis
- Elevated creatinine and decreased eGFR

## **22. lfm-40b (USA, Released: 2024-10-29)**