AVISE® SLE Monitor

Order ID A78052
Provider Exagen Provider MD

Specimen
Collected 03/20/2024
Received 03/21/2024

Test Order
Created 03/21/2024
Reported 03/22/2024

Patient **Sample, Susan**
Gender - DOB Female - 05/17/1968
Identifier Received
Exagen ID 1082071

AVISE SLE Monitor Test Report

	Value	Interpretation	Reference Range
Complement Component			
EC4d - Erythrocyte-bound C4d	6 Net MFI	Negative	FACS: <15 - Negative | ≥15 - Positive
Complement C3	107.6 mg/dL	Normal	Turbidimetry: 81 - 157 - Normal
Complement C4	27.0 mg/dL	Normal	Turbidimetry: 13 - 39 - Normal
Antibody Component			
+ Anti-dsDNA IgG	59.9 IU/mL	POSITIVE	CIA: <27 - Negative | 27 - 35 - Indeterminate | >35 - Positive
Anti-C1q IgG	18.1 Units	Negative	ELISA: <20 - Negative | ≥20 - Positive
Therapy Monitoring			
Hydroxychloroquine	1284.4 ng/mL	Supratherapeutic	
Methotrexate	63.4 nmol/L	Therapeutic	

Analyte Descriptions

EC4d

Erythrocyte-bound C4d (EC4d) measured by flow cytometry has been shown to significantly correlate with disease activity as measured by clinical SELENA-SLEDAI [1,2]. Furthermore, reductions in EC4d levels have been shown to correlate with improvements in SF-36 score and BILAG-2004 index [2].

Complement C3/C4

Normalization of complement C3 and C4 proteins has been shown to correlate with disease improvements in SLE [1-3].

Anti-dsDNA IgG

Anti-dsDNA is quantified using a bead-based chemiluminescence immunoassay method. Relative to other methods, values produced by this method have superior correlation with disease activity [3,4].

Anti-C1q IgG

Autoantibodies to C1q have been shown to significantly correlate with clinical SELENA-SLEDAI values and are superior to 3 other biomarkers in their association with lupus nephritis and proteinuria [2,3,5].

Test Method Description

The disease monitoring panel consists of C4d bound to erythrocytes (determined by flow cytometry), soluble complement C3c and C4 proteins (determined by immunoturbidimetry), and SLE auto-antibodies (anti-double stranded DNA and anti-C1q IgG, all determined by immunoassays). Changes in EC4d, anti-dsDNA, anti-C1q and complement proteins have been shown to correlate with change in SLE disease activity, as defined by clinical SELENA-SLEDAI, BILAG index score and proteinuria [1-3].

References

1. Kao A, et al. Arthritis Rheum. 2010 Mar; 62(3):837-844. doi: 10.1002/art.27267.
2. Buyon J, et al. Lupus Sci Med. 2016 Sept ;3(1) : e000165. doi: 10.1136/lupus-2016-000165.
3. Merrill J, et al. Lupus Sci Med. 2018 Apr;5(1):e000263. doi:10.1136/ lupus-2018-000263.
4. Mahler M, et al. J Immunol Res. 2017;2017:1720902. doi: 10.1155/2017/1720902.
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6. Exagen Diagnostics, Inc. Data on File.

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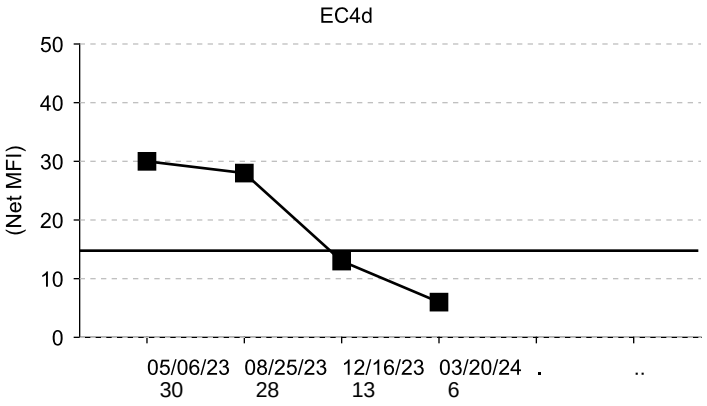
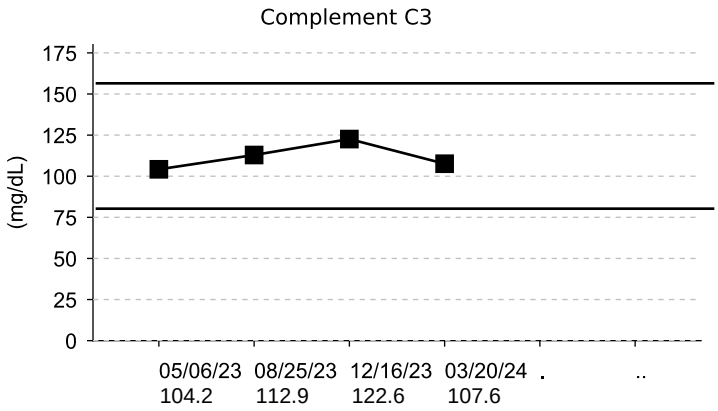
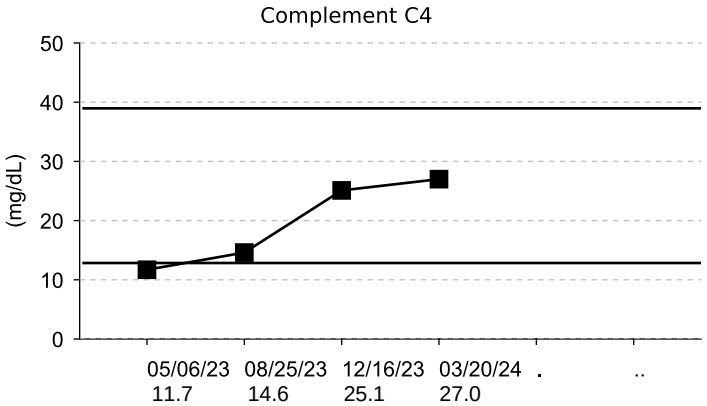
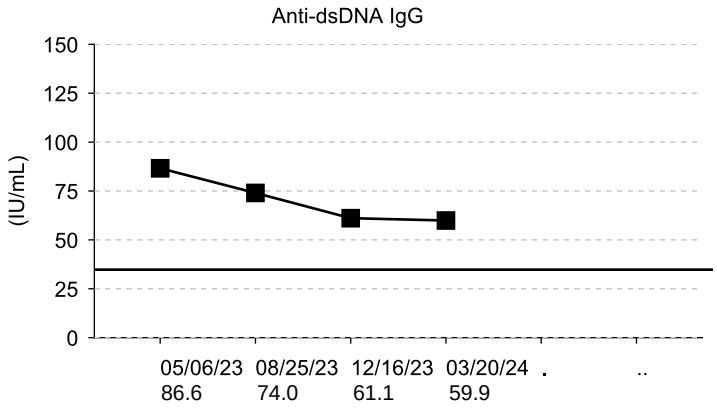
Complement Component

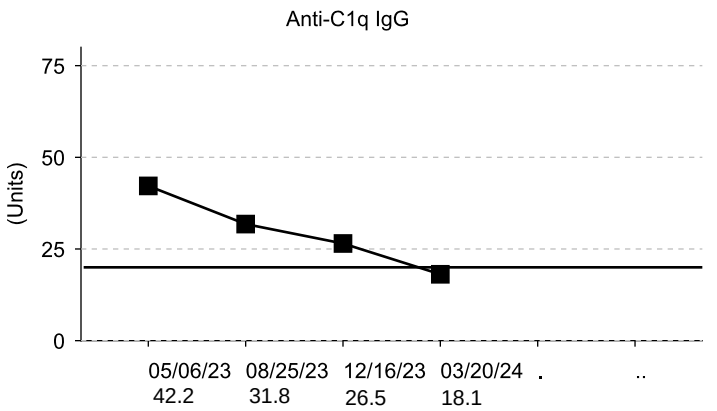






Antibody Component





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1261 Liberty Way, Vista CA 92081
CLIA# 05D1075048
CAP# 7201051 | NYSDOH PFI# 8369
Laboratory Director:
Prashanti Reddy, M.D.
Provider Relations: 888.452.1522

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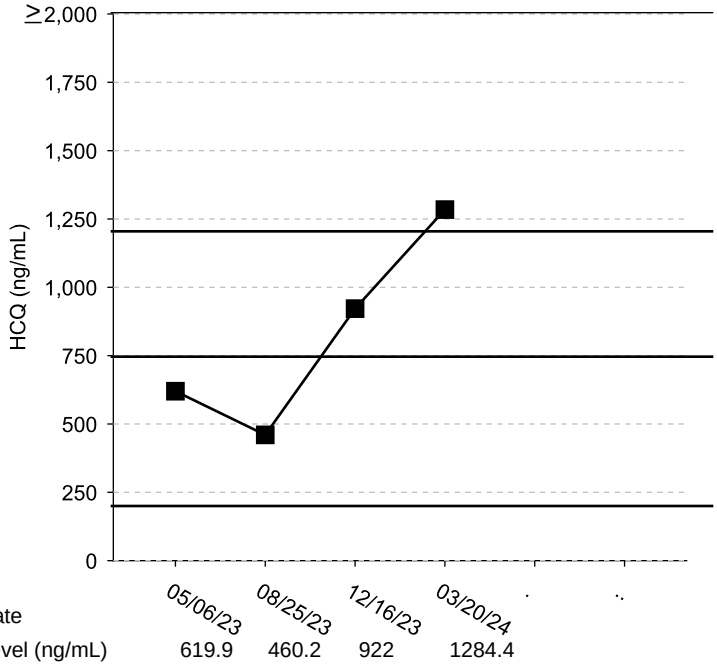
Avise HCQ Test Report

Current Hydroxychloroquine (HCQ) Level:

1284.4 ng/mL - Supratherapeutic

Current HCQ Dose (mg/day): 400

Current and Prior 5 HCQ Levels



Date	05/06/23	08/25/23	12/16/23	03/20/24
Level (ng/mL)	619.9	460.2	922	1284.4
Dose (mg/day)	200	200	400	400

HCQ Level	*Interpretation & Considerations*
Supratherapeutic (>1200 ng/mL):	**Level associated with clinical efficacy. HCQ is likely absorbed effectively. However, levels >1200 ng/ml have a minimal added benefit compared to levels in the therapeutic range (750 ng/ml - 1200 ng/ml). Thus, adjusting HCQ doses to maintain blood levels in the therapeutic range may maximize efficacy while limiting toxicity.**
Therapeutic (750-1200 ng/mL):	Levels associated with clinical efficacy. HCQ is likely to be absorbed effectively.
Subtherapeutic (200-<750 ng/mL):	Patient may be partially adherent to therapy. Patients with HCQ < 750 ng/mL can be at greater risk for disease flare. Thus, adjusting HCQ doses and/or discussing barriers to compliance may maximize efficacy.
Underexposed (<200 ng/mL):	Patient is likely non-adherent to HCQ therapy.

Risk Factors

Supratherapeutic: Excessive HCQ levels may arise from **(1) chronic kidney disease stage** (≥3 associated with higher odds), **(2) HCQ dose** (400 mg/day associated with higher odds compared to 200mg/day) and **(3) substantial weight loss**[7].

Test Method Description

HCQ concentration is determined by liquid chromatography coupled with mass spectrometry (LC/MS/MS).
This test has not been validated in pediatric populations. The HCQ blood level should be evaluated after 6 months of HCQ therapy - it has not been validated in patients treated for less than 6 months. This test cannot be used to assess the risk of HCQ toxicity.

References

1. Costedoat-Chalumeau N, et al. Arthritis Rheum. 2006 Oct;54(10):3284-90. doi: 10.1002/art.22156.
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AVISE MTX Test Report

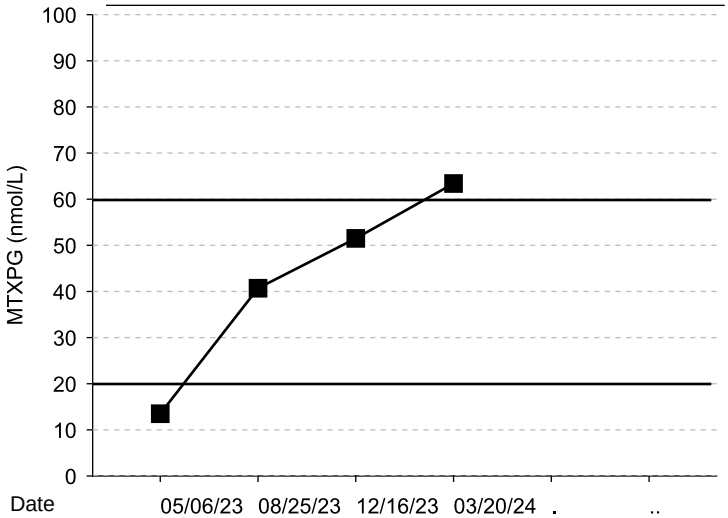
Current Methotrexate Polyglutamate (MTXPG) Level:

63.4 nmol/L - Therapeutic

Current MTX Dose (mg/week)

20

Current and Prior 5 MTXPG Levels



Date	05/06/23	08/25/23	12/16/23	03/20/24	.	..
Level (nmol/L)	13.5 †	40.7 †	51.5 †	63.4 †		
Dose (mg/week)	15	15	20	20		

MTXPG Level	*Interpretation & Consideration*
Therapeutic (>60 nmol/L)	Patient is metabolizing MTX effectively. Level is consistent with clinical efficacy
Intermediate (20-60 nmol/L)	Patient may need more exposure to MTX
Sub-therapeutic (<20 nmol/L)	Patient may not be metabolizing MTX effectively or patient may be non-compliant with therapy

†nmol/L RBC
‡nmol/L RBC equivalent

Test Method Description

AVISE MTX measures red blood cell methotrexate polyglutamates, the active metabolites of methotrexate as an aid in optimizing methotrexate dose and therapeutic efficacy in the treatment of rheumatoid arthritis. In a cohort of 256 rheumatoid arthritis patients taking methotrexate (range 5-25 mg/wk, median 15 mg/wk) for more than 3 months, those with a MTXPG level below 20 nmol/L were 3-fold more likely to have a poor response to methotrexate vs. those with level >=20 nmol/L (OR =2.9; 95% CI:1.4-5.9). Those with a MTXPG level above 60 nmol/L were 5-fold more likely to have a good response to methotrexate vs. those with level <=60 nmol/L (OR=5.5; 95% CI:2.5-12.0).

The MTXPG level is obtained by a liquid chromatographic method coupled with tandem mass spectrometry. The concentration from venous blood is expressed as nmol/L packed red blood cells (RBC). The concentration determined from whole capillary blood is expressed as nmol/L RBC equivalent. Studies supporting the clinical utility of this test are based on patients receiving methotrexate for at least 3 months. Caution should be used in interpreting results for patients on therapy for less than three months.

References

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2. Dervieux T, et al. Ann Rheum Dis 2005 Aug;64(8):1180-1185. doi: 10.1136/ard.2004.033399.
3. Dervieux T, et al. Arthritis Rheum. 2006 Oct;54(10):3095-103. doi: 10.1002/art.22129.
4. Kremer J, et al. Arthritis Rheum. 2004 May;50(5):1370-1382. doi: 10.1002/art.20278.

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