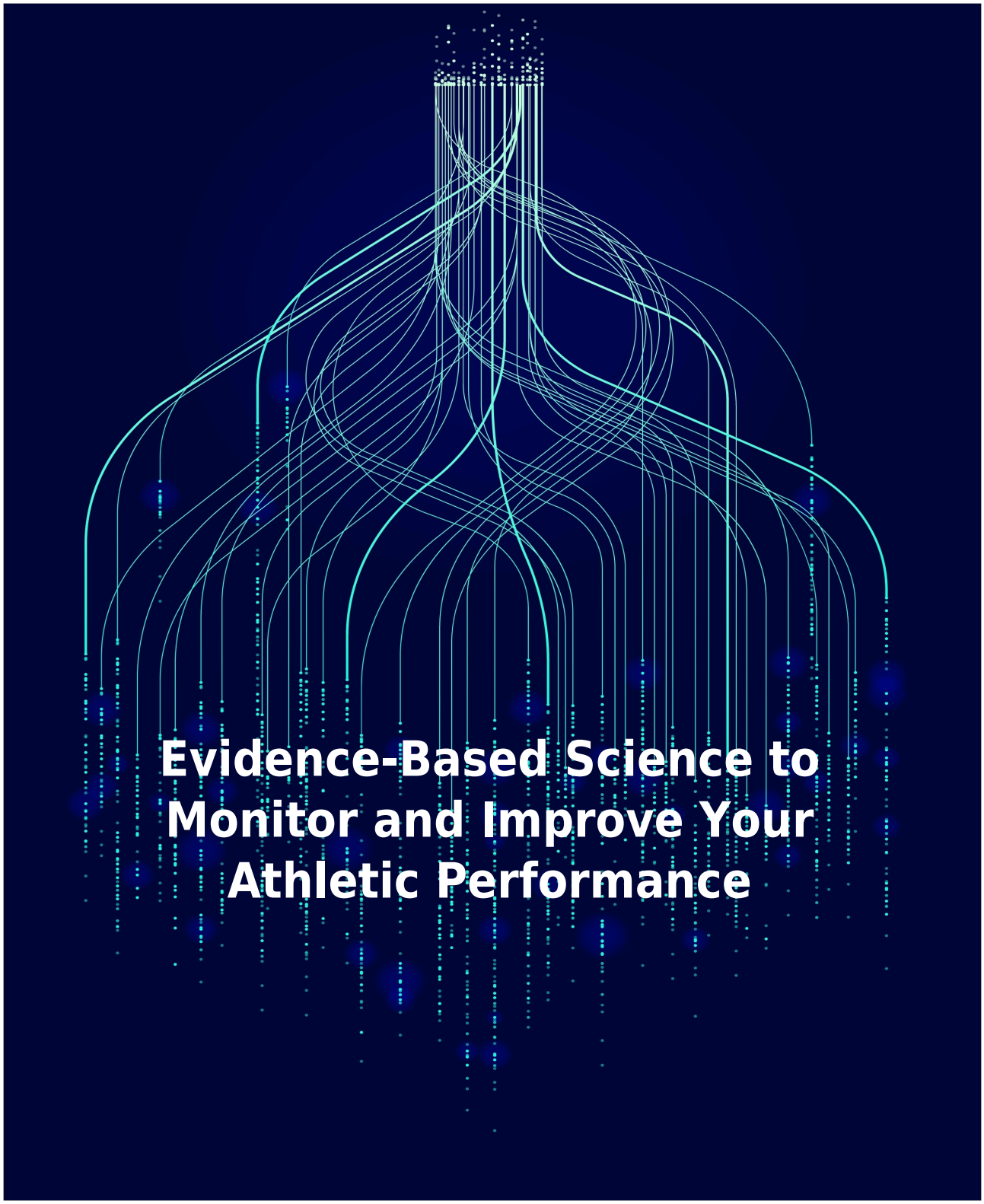
Athletic Performance Checkup

Detect, Act, Live Longer



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TERMS AND CONDITIONS

THIS TEST IS NOT INTENDED TO SUBSTITUTE OR REPLACE MEDICAL VISITS; ON THE CONTRARY, IT AIMS TO ENHANCE AND ENRICH THEM, PROVIDING PREVENTIVE AND COMPLEMENTARY INFORMATION THAT HELPS BOTH INDIVIDUALS AND HEALTHCARE PROFESSIONALS MAKE BETTER DECISIONS.

THE TRADITIONAL HEALTHCARE MODEL, CHARACTERISTIC OF MEDICINE 2.0, HAS HISTORICALLY BEEN FOCUSED ON DISEASE: IT CONCENTRATES ON DIAGNOSING AND TREATING ONCE SYMPTOMS APPEAR. ALTHOUGH THIS APPROACH HAS ENABLED MAJOR THERAPEUTIC ADVANCES, IT PRESENTS IMPORTANT LIMITATIONS: IT OFTEN ARRIVES TOO LATE, IS MORE REACTIVE THAN PREVENTIVE, AND FREQUENTLY DOES NOT TAKE INTO ACCOUNT THE INDIVIDUALITY OF EACH PERSON. IN CONTRAST, ALL OUR TESTS ARE BASED ON THE PRINCIPLES OF MEDICINE 3.0, A FAR MORE ADVANCED MODEL. MEDICINE 3.0 IS FOUNDED ON THE 4 “P’S” —PREDICTION, PREVENTION, PERSONALIZATION, AND PATIENT PARTICIPATION—. THIS MEANS ANTICIPATING RISKS BEFORE THEY TURN INTO DISEASES, INTERVENING EARLY WITH STRATEGIES GROUNDED IN SCIENTIFIC EVIDENCE, AND TAILORING RECOMMENDATIONS TO EACH INDIVIDUAL. MOREOVER, IT EMPOWERS PEOPLE TO TAKE AN ACTIVE ROLE IN MANAGING THEIR OWN HEALTH.

THIS REPORT CONTAINS A SERIES OF INTERPRETATIVE COMMENTS DEVELOPED FROM THE BEST AVAILABLE SCIENTIFIC EVIDENCE RELATED TO SYSTEMIC BIOLOGICAL CAPACITY AND HOMEOCINETIC REGULATION, AS WELL AS THE LATEST MEDICAL AND CLINICAL ADVANCES, IN ORDER TO PROVIDE AN UPDATED AND SUBSTANTIATED OVERVIEW OF YOUR CELLULAR EFFICIENCY AND METABOLIC ADAPTATION TO HIGH-DEMAND LOADS. BY CONTINUING TO READ THIS REPORT, YOU ACKNOWLEDGE YOUR ACCEPTANCE OF THE TERMS AND CONDITIONS ESTABLISHED HEREIN, AS WELL AS ALL WARNINGS AND LIMITATIONS CONTAINED WITHIN IT, EXPRESSLY RELEASING THE COMPANY FROM ALL LIABILITY.

Blueberry Diagnostics

XXES-117002095-00000004f

Report with Interpretative Commenting

Patient Information

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Identification Data		Personal Data	
Patient ID:	ES-XXXXXXXX	Gender at Birth:	Male
Patient Name:	JOHN	Date of Birth (day/month/year):	17/04/1987
Patient Surname:	SAMPLE	Age (years):	38
Blood Collection Date:	21/06/2025		

Laboratory Results (with Advanced Coefficients, Indices and/or Ratios)

Hemogram	Value	Min	Max	Visual Score
RBC Count (x10^12/L):	4.92	4.20	5.80	
Hgb (g/dL):	15.20	13.00	17.50	
HCT (%):	43.40	40.00	55.00	
HCT-to-Hgb Ratio:	2.86		3.20	

Red Blood Cell Indices	Value	Min	Max	Visual Score
MCV (fL):	88.21	80.00	101.00	
MCH (pg):	30.89	25.00	35.00	
MCHC (g/dL):	35.02	28.00	37.00	
RDW (%):	13.30		22.00	

Electrolytes	Value	Min	Max	Visual Score
Calcium (mg/L):	90.20	83.00	106.00	
Chloride (mmol/L):	107.00	102.00	111.00	
Magnesium (mg/dL):	2.18	1.60	2.60	
Potassium (mmol/L):	3.91	3.50	5.10	
Sodium (mmol/L):	140.00	136.00	145.00	

Corrected Electrolytes	Value	Min	Max	Visual Score
Corrected Calcium (mg/L):	90.20	83.00	106.00	
Corrected Chloride (mmol/L):	107.00	102.00	111.00	
Corrected Magnesium (mg/dL):	2.18	1.60	2.60	
Corrected Sodium (mmol/L):	140.00	136.00	145.00	

Electrolytic Ratios	Value	Min	Max	Visual Score
Ca-to-Mg Ratio:	4.14	2.41	5.00	
Na-to-K Ratio:	35.81	30.00	50.00	

Proteins	Value	Min	Max	Visual Score
Albumin (g/L):	46.59	32.00	48.00	
hs-CRP (mg/L):	1.02		5.00	
Cystatin C (mg/L):	0.89	0.62	1.11	
Ferritin (ng/mL):	76.20	22.00	322.00	

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Laboratory Results (with Advanced Coefficients, Indices and/or Ratios)

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Hepatic Enzymes	Value	Min	Max	Visual Score
AST (IU/L):	31.00		34.00	
ALT (IU/L):	21.00		49.00	
GGT (IU/L):	13.00		55.00	

Muscle and Cardiac Enzymes	Value	Min	Max	Visual Score
Creatine Kinase (IU/L):	249.00↑	46.00	171.00	

Sterols & Fatty Acids	Value	Min	Max	Visual Score
Total Cholesterol (mg/dL):	171.00		200.00	
HDL-c (mg/dL):	65.00	40.00		
Non-HDL-c (mg/dL):	106.00		150.00	
LDL-c (mg/dL):	97.00		130.00	
VLDL-c (mg/dL):	9.00↓	15.00	70.00	
Triglycerides (mg/dL):	45.00		150.00	

Hormones	Value	Min	Max	Visual Score
Total Testosterone (ng/mL):	7.52↑	1.97	6.70	
TSH (mIU/L):	2.70	0.55	4.78	
T4 Free (ng/dL):	1.19	0.89	1.76	

Vitamins	Value	Min	Max	Visual Score
Vitamin B12 (pg/mL):	484.00	211.00	911.00	
Vitamin D 25-OH (ng/mL):	50.92	30.00	100.00	

Other Serum Analytes	Value	Min	Max	Visual Score
Creatinine (mg/dL):	0.97	0.70	1.30	
eGFR (mL/min/1.73m^2):	102.83	90.00		
Creatinine-to-Cystatin C Ratio:	1.09↓	1.10		
Glucose (mg/dL):	86.00	74.00	106.00	
Serum Iron (µg/dL):	137.00	65.00	175.00	
Total Bilirubin (mg/dL):	0.89	0.30	1.20	
Urea (mg/dL):	48.00	19.00	49.00	
BUN (mg/dL):	22.40	10.00	25.00	
BUN-to-Creatinine Ratio:	23.09↑	12.00	20.00	
Uric Acid (mg/dL):	5.50	3.70	9.20	

Technical Interferences

Serum	Value
Hemolyzed Sample:	No
Icteric Sample:	No
Lipemic Sample:	No

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Legend

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Values are within the reference range limits.
Values are outside the reference range limits.
Values are outside the reference range limits, concretely more than 4 times the normality upper limit.

Technical Validation of Laboratory Results

Laboratory: Laboratorio Echevarne, S.A.

Coefficients, Indices and Ratios Descriptions

In addition to the results provided by Laboratorio Echevarne, Blueberry Diagnostics has added to this report several innovative coefficients, indices and ratios —calculated and validated by the company itself—, to help your healthcare providers to get a more accurate diagnosis since, they can provide a holistic view of the state of your health by integrating multiple factors that can allow clinicians to have more comprehensive data, potentially leading to better-informed decisions.

Besides, they also can improve the sensitivity and specificity of predictions —by reducing false positives and false negatives—. Moreover, they can also help differentiate between diseases with similar clinical presentations —reducing the probability of misinterpretation or excessive dependence on a single parameter—. Furthermore they can guide treatment decisions to improve patient outcomes.

NOTE: No coefficient, indice or ratio should be used in isolation, since they are specifically designed to provide additional insight when an abnormality is detected. For example, the AST-to-ALT ratio has no clinical value if no liver disease is present —regardless of whether the result is altered—. However, if liver injury exists, the AST-to-ALT ratio can help to differentiate whether the damage is of alcoholic or viral origin, non-alcoholic fatty liver disease (NAFLD), or mild hepatocellular injury. In this way, it is possible that not all coefficients, indices or ratios will be mentioned in the reports, even if their values are altered.

You will find a complete description by scanning the QR code of this section.

Evaluation and Performance Criteria

NOTE ON EVALUATION CRITERIA: IT IS COMPLETELY NORMAL TO RECEIVE AN OPTIMIZATION NOTICE IN ANY SCORE PILLAR IN THE FOLLOWING PAGES EVEN IF INDIVIDUAL ANALYTES FALL WITHIN THE NORMAL RANGE OF THE TRADITIONAL LABORATORY, AS TRADITIONAL LABORATORY RANGES ARE SOLELY DESIGNED TO RULE OUT PATHOLOGY OR CLINICAL DISEASE IN THE GENERAL POPULATION.

IN CONTRAST, THE CRITERIA FOR THIS TEST APPLY MUCH NARROWER, MORE DEMANDING METABOLIC AND PHYSIOLOGICAL EFFICIENCY INTERVALS, TAILORED SPECIFICALLY FOR INDIVIDUALS ALREADY TRAINING AT AN ACTIVE LEVEL WHO SEEK TO OPTIMIZE PERFORMANCE.

CONSEQUENTLY, AN ALERT IN ANY BLOCK DOES NOT INDICATE DISEASE, BUT RATHER POINTS OUT A TRANSIENT SATURATION, ROOM FOR IMPROVEMENT, OR AN EFFICIENCY LEAK IN THE ADAPTATION TO HIGH PHYSICAL WORKLOADS.

Athletic Performance Score (APS)

CE

Summary Results (Athletic Performance Score: 96.00)

The analytical profile demonstrates a state of physical performance and systemic homeostasis within adequate reference ranges. The metabolic, endocrine, electrolyte, and transport pillars are functionally coordinated, providing life-support systems with a stable biological base to express athletic potential and safely adapt to high-level training loads.

Athletic Performance Score (APS) Description

The Athletic Performance Score (APS) offers an overview of systemic biological capacity. The APS analyzes deep oxygenation kinetics (iron storage deposits), cell-membrane signaling (hormonal axis synchronization), and advanced metabolic regulation (homeostatic balance and tissue regeneration).

An optimal score indicates that deep cellular life-support systems are correctly aligned, allowing for a maximized adaptation to competitive workloads.

However, if this score is lower than expected, the cause usually lies in a latency of the cellular oxygen debt or a sub-optimization of anabolic signaling, which limits real-time tissue repair and supercompensation between sessions.

In summary, the Athletic Performance Score (APS) measures structural resilience and cellular efficiency capacity to sustain high-intensity efforts based on the following pillars:

Oxygenation and Transport Pillar Results (Score: 100.00)

Iron kinetics, hemoglobin levels, and hematocrit parameters are within an adequate state of metabolic efficiency. Balanced levels ensure sufficient oxygen saturation and robust erythrocyte support to sustain mitochondrial oxidative phosphorylation under maximum effort. This condition supports time in an aerobic steady state, helps delay the onset of the lactate threshold, and assists tolerance to prolonged intensity workloads.

Hydroelectrolytic Pillar Results (Score: 85.71)

Osmotic homeostasis, plasma electrolyte balance, and serum magnesium levels are maintained in an adequate state of cellular equilibrium. Stability in ionic ratios supports neuromuscular relaxation, the integrity of the action potential, and proper tissue excitability during muscle contraction. This physiological state helps prevent acute drops in performance from microvascular dehydration while supporting contractile capacity under fatigue.

Endocrine and Metabolic Pillar Results (Score: 97.71)

The primary endocrine and metabolic status demonstrates stable androgenic signaling and proper thyroid axis activity. This hormonal environment supports the energy assimilation and protein synthesis processes necessary for strength development, assisting biological vitality, tolerance to competitive load, and a basal metabolism aligned with intensity demands.

Vitamins Pillar Results (Score: 100.00)

The essential micronutrient and vitamin profile is within an adequate state of functional saturation. The availability of these master cofactors ensures a stable biochemical environment for cellular replication, post-effort immunomodulatory response, and bone tissue structural health, while acting as an enzymatic catalyst for energy production and cognitive focus preservation.

Hepatic and Renal Pillar Results (Score: 87.63)

Tissue cellular integrity, acute inflammatory baselines (hs-CRP), and organic filtration systems demonstrate an adequate clearance capacity. Controlled levels confirm that the body is processing and eliminating the systemic stress and wear derived from physical exertion, keeping the hepatic, renal, and immune baselines free of metabolic overload.

Cardiovascular and Lipids Pillar Results (Score: 100.00)

The metabolic profile reflects steady baseline glucose regulation and balanced lipid transport dynamics. This homeostasis supports proper carbohydrate efficiency for glycogen replenishment, maintains fluid cell membranes for lipid beta-oxidation, assists endothelial elasticity, and minimizes peripheral hemodynamic resistance factors during exertion.

Cardiovascular Score (CVS)

CE

Summary Results (Cardiovascular Score: 94.00)

Optimization notice: the system has identified variations or imbalances in one or more pillars of the cardiovascular evaluation, including glycemic, rheological, or low-grade inflammatory alerts (hs-CRP). The presence of these biological markers indicates that the body is experiencing metabolic efficiency leaks or an increase in hemodynamic stress due to the current physical load. It is recommended to thoroughly review the affected blocks (lipids/glucose, rheology, or endothelial inflammation) and make corresponding adjustments in recovery, nutrition, or workload dosage to prevent a performance plateau or premature vascular wear.

Note on evaluation criteria: it is completely normal to receive an Optimization notice in a pillar even if individual analytes fall within the normal range of the traditional laboratory, as traditional laboratory ranges are solely designed to rule out pathology or clinical disease in the general population. In contrast, the criteria for this test apply much narrower, more demanding metabolic and physiological efficiency intervals, tailored specifically for individuals already training at an active level who seek to optimize performance. Consequently, an alert in this block does not indicate disease, but rather points out a transient saturation, room for improvement, or an efficiency leak in the adaptation to high physical workloads.

Cardiovascular Score (CVS) Description

The Cardiovascular Score (CVS) offers an overview of foundational hemodynamic efficiency. The CVS analyzes endothelial protection (vascular flexibility), microvascular oncotic pressure (fluid retention), and the lipid transport profile (atherogenic clearance and membrane fluidity).

An optimal score indicates that vascular and structural protection systems are correctly aligned, allowing for a safe adaptation to prolonged workload capacity.

However, if this score is lower than expected, the cause usually lies in a compromise of the endothelial buffering capacity or a sub-optimization of lipid transport, which limits real-time tissue perfusion during exertion.

In summary, the Cardiovascular Score (CVS) measures vascular resilience and fluid distribution capacity to sustain high-intensity efforts based on the following pillars:

Lipid Transport and Atherogenic Pillar Results (Score: 100.00)

The lipid transport, atherogenic clearance, and baseline glucose regulation are within an adequate range. The balance between HDL and LDL cholesterol combined with stable glycemic control demonstrates metabolic management adapted to physical demands, helping arteries remain free of stagnant fatty deposits or glycation stress. This steady flow contributes to moderating peripheral vascular resistance, protecting the myocardium from unnecessary pressure overloads during intensity sports efforts.

Hemodynamic Pillar Results (Score: 100.00)

Blood fluidity, erythrocyte mass regulation, and metabolic clearance are in an adequate state of balance. The plasma presents a regular functional viscosity supported by stable hemoglobin and hematocrit percentages, which favors stable capillary conduction and sufficient perfusion velocity in muscle tissues without elevating afterload. Controlled levels of nitrogenous and metabolic byproducts confirm efficient clearance capacity under the current training load.

Endothelial Pillar Results (Score: 69.29)

There is room for improvement in the inflammatory control and metabolic support factors that protect the arterial endothelium, compromised by elevations in High-Sensitivity C-Reactive Protein (hs-CRP) or insufficient levels of Vitamin D and Albumin. Vascular low-grade inflammation or inadequate carrier proteins reduce the capacity of blood vessels to modulate the renin-angiotensin system and elastically buffer the mechanical stress caused by intensity training. It is advisable to minimize systemic vascular stress and reinforce these cofactors to preserve vascular flexibility.

Recovery & Fatigue Score (RFS)

CE

Summary Results (Recovery & Fatigue Score: 91.00)

Optimization notice: a homeostatic deficit has been detected in the regeneration systems and accumulated fatigue balance, including potential neuromuscular, glycemic, or systemic low-grade inflammatory alerts (hs-CRP). In high-demand sports, unresolved physiological shifts (such as hormonal or muscular catabolism, delayed glycogen reload, hepatorenal clearance saturation, or tissue oxygenation debts) can interrupt biological supercompensation and increase the risk of injuries or chronic overtraining. It is recommended to prioritize structural deload periods and optimize recovery support guidelines in the highlighted pillars.

Recovery & Fatigue Score (RFS) Description

The Recovery & Fatigue Score (RFS) assesses deep homeostatic regeneration capacity. Through this score, it can be determined whether the body is successfully overcoming the cumulative workload by monitoring systemic clearance saturation, tissue oxygenation debts, complex anabolic signaling, and muscle protein turnover stability.

A high score reflects a state of integrated supercompensation where all biological and structural systems cooperate smoothly to receive new intense training stimuli.

On the other side, a decrease in this score serves as a preventive alert for a homeostatic deficit, indicating that the regenerative systems require co-factor optimization, an adjustment to counteract muscle tissue catabolism, or a period of structural physical deloading to prevent chronic overtraining.

In summary, the Recovery & Fatigue Score (RFS) quantifies biological shifts, muscular preservation, and cellular restoration efficiency following high-level training stress based on the following pillars:

Oxygenation Pillar Results (Score: 100.00)

Baseline oxygenation status, circulating hemoglobin mass, hematocrit parameters, and stable iron stores sit within adequate physiological saturation levels. This steady availability supports a stable environment for cellular respiration and adaptive angiogenesis during rest phases, allowing for regular muscle fiber restoration and ensuring that each training cycle begins without carrying hematological fatigue.

Organic Stress Pillar Results (Score: 99.06)

Cellular integrity indices, sarcomeric stability, low-grade systemic inflammation control (hs-CRP), and hepatorenal organic clearance capacity are within Fusion ranges. The body is successfully metabolizing, neutralizing, and excreting muscle catabolites and inflammatory byproducts derived from intensive effort. The accelerated dissipation of systemic inflammation confirms that organic systems are in a steady rest phase, free from metabolic overload and ready to adapt to new stimuli.

Metabolic Pillar Results (Score: 100.00)

The biochemical, vitamin, glycemic regulation, and magnesium support environment is within an adequate state of functional sufficiency. A stable panel of immunomodulatory micronutrients, efficient carbohydrate substrates for glycogen reloading, and neuromuscular cofactors act as direct metabolic catalysts, supporting the replenishment of mitochondrial energy stores (ATP), protecting neural structures, and assisting muscle relaxation against exercise stress.

Endocrine Pillar Results (Score: 85.00)

The basal endocrine environment is within a steady phase of anabolic signaling and metabolic stability. Balanced synchronization of the androgenic and thyroid hormonal axes ensures that chemical signals

responsible for activating deep protein synthesis and cellular restoration are executed regularly during rest, supporting systemic regeneration aligned with physical demands.

Muscular Pillar Results (Score: 68.18)

The biomarker profile indicates a catabolic state where muscle tissue degradation may be outpacing recovery, a common response to excessive training volume or insufficient rest. Even slight deficits below this threshold suggest that the muscle-to-cystatin ratio is sub-optimal for advanced performance, increasing the risk of overtraining syndrome. Adjusting training load and optimizing nutritional and recovery strategies are highly advised to protect lean mass.

Supplements

CE

Disclaimer: About Supplement Safety

ALTHOUGH SUPPLEMENTS ARE GENERALLY SAFE FOR MOST ADULTS WHEN USED AT RECOMMENDED DOSES AND DURATIONS, EXCESSIVE INTAKE MAY CAUSE GASTROINTESTINAL DISCOMFORT. IN THIS WAY, CAUTION IS NEEDED WHEN COMBINING SUPPLEMENTS WITH MULTIVITAMIN OR MULTIMINERAL COMPLEXES, AS OVERLAPPING INGREDIENTS MAY LEAD TO EXCESSIVE INTAKE.

ALWAYS READ THE PRODUCT LABEL CAREFULLY, INCLUDING EXCIPIENTS AND ADDITIVES, AND CONSULT YOUR DOCTOR OR PHARMACIST IF IN DOUBT. THIS IS ESPECIALLY IMPORTANT FOR INDIVIDUALS WITH A HISTORY OF ALLERGIES, AUTOIMMUNE CONDITIONS, GASTROINTESTINAL DISORDERS, OR THOSE ON CHRONIC MEDICATION.

BEFORE STARTING ANY SUPPLEMENTATION, WE SUGGEST GENERAL PRACTITIONER (GP) CONSULTATION IF YOU HAVE HEART CONDITIONS, LIVER OR KIDNEY DISEASE, A HISTORY OF KIDNEY STONES, EPILEPSY OR BIPOLAR DISORDER. IT IS NOT RECOMMENDED TO INITIATE SUPPLEMENTATION WITH MINERALS, VITAMINS, OR ANY OTHER NUTRACEUTICAL WITHOUT PRIOR CLINICAL OR LABORATORY EVALUATION —SUCH AS THE ONE INCLUDED IN THIS TEST—, TO JUSTIFY ITS NECESSITY —UNNECESSARY USE MAY LEAD TO SEVERE SIDE EFFECTS—.

Warning: Supplements do not Replace a Proper Diet

While nutritional supplements can help correct deficiencies, enhance specific functions, or support targeted treatments, they should not replace a healthy, varied, and balanced diet. In this way, recent studies emphasize the importance of consuming up to 40 different foods per week from the following categories: vegetables rich in fiber, vitamins, and antioxidants; fruits that provide fiber, water, and micronutrients; nuts, seeds, and legumes; healthy animal and plant-based proteins; whole grains, tubers, and natural derivatives; dairy and fermented options; healthy fats; and natural herbs and spices.

Finally, once serum levels are normalized by improving your diet or recommended supplementation, reducing to a maintenance dose —or stopping completely—, may be appropriate, depending on ongoing clinical and laboratory evaluation.

Recommended Supplements to Enhance Athletic Performance Score (APS) CE

No Supplementation Required Across All Pillars of the Athletic Performance Score

All core athletic systems operate at maximum efficiency under high workloads. Your metabolic pathways, fluid dynamics, and endocrine biomarkers demonstrate a flawless synergy, indicating a highly optimized state of conditioning.

Exogenous compounds are unnecessary at this time and could disrupt this exceptional balance. The ideal strategy is to maintain your highly effective nutrition and training structure.

Recommended Supplements to Enhance Cardiovascular Score (CVS)

CE

Supplementation to Enhance the Endothelial Metabolic Support Pillar

To optimize endothelial compliance, counteract acute-phase vascular inflammation (hs-CRP), and maximize nitric oxide pathways, we suggest Sports Medical Doctor or General Practitioner (GP) consultation to evaluate starting supplementation with L-Citrulline Malate, defining the dosage according to your needs. This supplementation drops peripheral vascular resistance, shielding the vessel walls against low-grade inflammatory stress.

On the other hand, if symptoms of diminished muscular hyperemia, elevated hs-CRP baselines, or systemic vascular stiffness were to appear under heavy physical stress, adding Pycnogenol or a high-potency Curcumin C3 Complex would provide targeted suppression of vascular inflammatory cascades and enhance microvascular nitric oxide synthesis.

Recommended Supplements to Enhance Recovery & Fatigue Score (RFS) CE

Supplementation to Enhance the Muscular Recovery Pillar

To halt systemic muscle tissue breakdown and accelerate nocturnal amino acid remodeling, we suggest Sports Medical Doctor or General Practitioner (GP) consultation to evaluate starting supplementation with Micellar Casein paired with HMB, defining the dosage according to your needs. This combination delivers a steady amino acid flux through the night, blocking the ubiquitin-proteasome pathway.

On the other hand, if symptoms of loss of acute power, dry muscle mass reduction across demanding microcycles, or severe persistent weakness were to appear, adding L-Glutamine would support gut integrity, cell volumization, and positive nitrogen balance.

Supporting Scientific Literature

CE

Peer-Reviewed Studies and Clinical Evidence Underwriting our Scoring Algorithms

The following is a selection of indexed scientific literature and international consensus statements underpinning the development of our analytical models. These references validate the optimized thresholds for athletes, ensuring that the assessment of their homeostasis, metabolic profile, and adaptive capacity is conducted under the highest standards of contemporary sports medicine.

- Banfi G, Colombini A, Lombardi G, Lubkowska A. Metabolic markers in sports medicine. Advances in Clinical Chemistry. 2012;56:1-54. doi:10.1016/b978-0-12-394317-0.00015-7
- Brancaccio P, Maffulli N, Limongelli FM. Creatine kinase monitoring in sport medicine. Br Med Bull. 2007;81-82:209-230. doi:10.1093/bmb/ldm014
- Burden RJ, Morton K, Richards T, Whyte GP, Pedlar CR. Is iron treatment beneficial in, iron-deficient but non-anaemic (IDNA) endurance athletes? A systematic review and meta-analysis. Br J Sports Med. 2015;49(21):1389-1397. doi:10.1136/bjsports-2014-093624
- Clénin G, Cordes M, Huber A, et al. Iron deficiency in sports - definition, influence on performance and therapy. Swiss Med Wkly. 2015;145:w14196. Published 2015 Oct 29. doi:10.4414/smw.2015.14196
- Convertino VA. Blood volume response to physical activity and inactivity. Am J Med Sci. 2007;334(1):72-79. doi:10.1097/MAJ.0b013e318063c6e4
- Fragala MS, Kraemer WJ, Denegar CR, Maresh CM, Mastro AM, Volek JS. Neuroendocrine-immune interactions and responses to exercise. Sports Med. 2011;41(8):621-639. doi:10.2165/11590430-000000000-00000
- Hackney AC, Dobridge JD. Thyroid hormones and the interrelationship of cortisol and prolactin: influence of prolonged, exhaustive exercise. Endokrynol Pol. 2009;60(4):252-257.
- Hackney AC, Sinning WE, Bruot BC. Hypothalamic-pituitary-testicular axis function in endurance-trained males. Int J Sports Med. 1990;11(4):298-303. doi:10.1055/s-2007-1024811
- Hawley JA, Hargreaves M, Joyner MJ, Zierath JR. Integrative biology of exercise. Cell. 2014;159(4):738-749. doi:10.1016/j.cell.2014.10.029
- Herrmann M, Obeid R, Scharhag J, Kindermann W, Herrmann W. Altered vitamin B12 status in recreational endurance athletes. Int J Sport Nutr Exerc Metab. 2005;15(4):433-441. doi:10.1123/ijsnem.15.4.433
- Kheiri B, Abdalla A, Osman M, Ahmed S, Hassan M, Bachuwa G. Vitamin D deficiency and risk of cardiovascular diseases: a narrative review. Clin Hypertens. 2018;24:9. Published 2018 Jun 22. doi:10.1186/s40885-018-0094-4
- Kreher JB. Diagnosis and prevention of overtraining syndrome: an opinion on education strategies. Open Access J Sports Med. 2016;7:115-122. Published 2016 Sep 8. doi:10.2147/OAJSM.S91657
- Mann S, Beedie C, Jimenez A. Differential effects of aerobic exercise, resistance training and combined exercise modalities on cholesterol and the lipid profile: review, synthesis and recommendations. Sports Med. 2014;44(2):211-221. doi:10.1007/s40279-013-0110-5
- Meeusen R, Duclos M, Foster C, et al. Prevention, diagnosis, and treatment of the overtraining syndrome: joint consensus statement of the European College of Sport Science and the American College of Sports Medicine. Med Sci Sports Exerc. 2013;45(1):186-205. doi:10.1249/MSS.0b013e318279a10a
- Melinda Sheffield-Moore (2000) Androgens and the control of skeletal muscle protein synthesis, Annals of Medicine, 32:3, 181-186, DOI: 10.3109/07853890008998825
- Peeling P, Dawson B, Goodman C, Landers G, Trinder D. Athletic induced iron deficiency: new insights into the role of inflammation, cytokines and hormones. Eur J Appl Physiol. 2008;103(4):381-391. doi:10.1007/s00421-008-0726-6
- Reijnierse EM, Trappenburg MC, Leter MJ, et al. Serum albumin and muscle measures in a cohort of healthy young and old participants. Age (Dordr). 2015;37(5):88. doi:10.1007/s11357-015-9825-6
- San-Millán I, Brooks GA. Assessment of Metabolic Flexibility by Means of Measuring Blood Lactate, Fat, and Carbohydrate Oxidation Responses to Exercise in Professional Endurance Athletes and Less-Fit Individuals. Sports Med. 2018;48(2):467-479. doi:10.1007/s40279-017-0751-x
- Shirreffs SM, Sawka MN. Fluid and electrolyte needs for training, competition, and recovery. J Sports Sci. 2011;29 Suppl 1:S39-S46. doi:10.1080/02640414.2011.614269
- Sim M, Garvican-Lewis LA, Cox GR, et al. Iron considerations for the athlete: a narrative review. Eur J Appl Physiol. 2019;119(7):1463-1478. doi:10.1007/s00421-019-04157-y
- Snyder CK, Lapidus JA, Cawthon PM, et al. Serum albumin in relation to change in muscle mass, muscle strength, and muscle power in older men. J Am Geriatr Soc. 2012;60(9):1663-1672. doi:10.1111/j.1532-5415.2012.04115.x
- Solberg A, Reikvam H. Iron Status and Physical Performance in Athletes. Life (Basel). 2023;13(10):2007. Published 2023 Oct 2. doi:10.3390/life13102007
- Tall AR. An overview of reverse cholesterol transport. European Heart Journal. 1998 Feb;19 Suppl A:A31-5. PMID: 9519340.

Technical note: Bibliographic references are formatted in accordance with international Vancouver/American Medical Association (AMA) biomedical standards.

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