

Peer-Reviewed Study Finds Epigenetic Sperm Testing Helps Personalize Fertility Treatment, Avoid Ineffective Procedures

Analysis of 537 couples shows abnormal SpermQT™ results, associated with zero IUI pregnancies despite normal semen analysis, IVF-ICSI outcomes were unaffected.



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-- A [new peer-reviewed study](#) published by the Journal of Assisted Reproduction and Genetics reports that an epigenetic sperm quality test, SpermQT™, can help clinicians better personalize fertility care by identifying men unlikely to benefit from intrauterine insemination (IUI), even when conventional semen analysis appears normal.

The multi-center, real-world analysis examined de-identified outcomes from 537 couples treated at 10 fertility clinics across the United States, making it the largest independent, multi-site evaluation of epigenetic sperm testing to date.

The study's collaborators include Kristin Brogaard (Path Fertility), Susan Hudson, MD (Texas Fertility Center), Carrie Bedient, MD (The Fertility Center of Las Vegas), Abby Eblen, MD (Nashville Fertility), Kristin Van Heertum (Nashville Fertility), Emma Giuliani (The Fertility Center), Meghan Smith, MD (Nashville Fertility), Madeline Kaye, MD (Texas Fertility Center), Amy Schutt, MD (Texas Fertility Center), Lisa Hansard, MD (Texas Fertility Center), Valerie Shavell, MD (Texas Fertility Center), Kaylen Silverberg, MD (Texas Fertility Center), Mili Thakur, MD (The Fertility Center), Andrew Olson (Path Fertility), Ryan Miller (US Fertility), Lorry Schneider (Inherent Biosciences), Derek Petersen (Path Fertility), Bryce Daines, PhD (Inherent Biosciences), Lakingya Robinson, DHA, MHA, MLS (ASCP) CM (Ovation Fertility), Alexis Reynolds, MS (Aspire Fertility Dallas), Nirvika Singh Sharma, MS, ELD (ABB), MBBS, ELS, ALS (Ovation Fertility), Khalied Kaskar, PhD, HCLD (Ovation Fertility), Jordan Kassab (Trek Health), Larry Lipshultz, MD (Baylor College of Medicine) and Matthew "Tex" VerMilyea, PhD, HCLD/CC (US Fertility, Ovation Fertility).

Study findings

Among 202 couples who completed at least one IUI, 22% of those with normal SpermQT results

achieved pregnancy, compared with 0% of those with abnormal SpermQT results, despite similar sperm count, motility, and partner ages.

These findings remained statistically significant even after adjusting for differences across physicians and clinics, suggesting the result was not driven by site-specific practice patterns.

In contrast, among 90 couples who underwent IVF with intracytoplasmic sperm injection (IVF-ICSI), pregnancy rates did not differ significantly based on SpermQT result — consistent with prior research indicating that ICSI may overcome epigenetic sperm impairments.

Gene-level analysis showed that abnormal SpermQT results were enriched for dysregulated promoters involved in key sperm functions, including spermatogenesis, chromatin remodeling, and acrosome biology, supporting the biological relevance of the test.

What this means for patients and clinicians

While semen analysis remains the clinical standard for evaluating male fertility, the study reinforces longstanding concerns about its limited ability to predict treatment success. Many men in the “abnormal SpermQT” group had total motile sperm counts that would traditionally be considered “normal” and adequate for IUI, yet none achieved pregnancy through IUI in this study.

“This study supports using SpermQT to personalize fertility treatment and avoid ineffective treatments,” the authors conclude.

Andy Olson, Co-Founder & CEO of Path Fertility commented, “For too long, treatment decisions have relied primarily on conventional semen parameters such as concentration, motility, and morphology which offer limited insight into the underlying biological quality of sperm. This real-world, multi-site study demonstrates that epigenetic sperm testing can provide actionable insight that helps clinicians choose the right treatment sooner, reduce emotional and financial burden on patients, and improve overall efficiency in fertility care.”

About the study

The analysis included 537 men whose clinicians ordered SpermQT over an 18-month period. Outcomes were compared across IUI and IVF-ICSI cycles while accounting for partner ages, total motile sperm count, number of cycles, and provider- and clinic-level variation.

The authors note that, like all real-world studies, the analysis was limited by available clinical data and potential selection bias, as SpermQT was ordered at physician discretion. Nevertheless, the findings align with prior retrospective research and strengthen the evidence base for incorporating epigenetic sperm assessment into routine fertility evaluation.

“What makes this study compelling is that it reflects everyday clinical practice across a geographically diverse network of fertility clinics. Even in that real-world setting, abnormal SpermQT results consistently aligned with poor IUI outcomes, while IVF-ICSI success remained unaffected. This suggests that epigenetic sperm quality is a meaningful biological factor that clinicians and patients should consider when planning treatment,” said corresponding author Matthew “Tex” VerMilyea, PhD, HCLD/CC, research lead at Ovation Fertility. said corresponding author Matthew “Tex” VerMilyea, PhD, HCLD/CC, research lead at Ovation Fertility.

The full study is available online in the Journal of Assisted Reproduction and Genetics.

About Path Fertility

Path Fertility is pioneering epigenetic diagnostics in reproductive health. The company is dedicated to closing the gap in fertility technology, starting with male infertility, through innovative, clinically validated tests that improve outcomes, reduce unnecessary treatments, and bring greater clarity to fertility care. Path Fertility’s portfolio includes SpermQT™, NOA Guide™, and a pipeline of next-generation diagnostics aimed at transforming how reproductive health is measured and managed. Visit www.pathfertility.com for more info.

About Ovation Fertility

Ovation Fertility, part of the US Fertility network, is a leading national consortium of IVF laboratories dedicated to advancing reproductive care. Working closely with affiliated physician practices, Ovation leverages cutting-edge, evidence-based fertility treatments to provide hopeful parents with the highest chances of success. Ovation offers a comprehensive range of services, including frozen donor and surrogacy services and secure storage solutions for frozen biomaterials. Together, Ovation and its partners are committed to setting new standards in reproductive medicine. Learn more at www.ovationfertility.com.

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