

Synovasure[®]

Alpha Defensin Lateral Flow Test



**WHEN YOU
NEED TO KNOW
NOW**

A white, rectangular test kit for Synovasure Defensin. The top of the kit has the brand name "Synovasure" and "Defensin" printed on it. Below the name are three horizontal lines. Further down, there are fields for "ID:" and "Date:". A vertical window in the center shows a dark liquid level. At the bottom of the kit, there are two horizontal lines, one labeled "C" and one labeled "T".

Synovasure[®]
Defensin

"With this test, health care professionals now have an **additional option** available **to aid their clinical assessment** as to whether the patient has an infection and requires revision surgery.

Whereas, before surgeons may have opted for surgery when the presence of an infection was unclear, with this test, they have **more information** and could potentially **reduce patient risk** by avoiding unnecessary revision operations for replacement joints."



Tim Stenzel, M.D., Ph.D.,

Director, Office of In Vitro Diagnostics and Radiological Health

US FDA Center for Devices and Radiological Health

FDA News Release, May 23, 2019.

PJI - A Serious Complication

Periprosthetic Joint Infection (PJI) is one of the most common complications following total joint arthroplasty, accounting for 25% of total knee arthroplasty failures and 16% of total hip arthroplasty failures.¹ Furthermore, PJI places major stress on the healthcare system including patients, payers and hospital systems.

Making a timely and accurate diagnosis of PJI is key in the creation of an informed treatment plan and helping to improve patient outcomes.

Alpha Defensin - Aiding Diagnosis of PJI

Alpha defensin is an antimicrobial peptide released into the body through activated neutrophils in response to an infection. In cases of PJI, a patient will have elevated levels of alpha defensin in their synovial fluid.

Clinical findings show that alpha defensin test results are not influenced by:

- Prior antibiotic administration^{2,3}
- Comorbidities related to inflammation²
- Type and/or virulence of the organism^{2,4}

Since discovery, alpha defensin has aided in the diagnosis of PJI following total joint replacement. In 2018, alpha defensin biomarker was included as a minor criteria for diagnosing PJI by the International Consensus Meeting (ICM) on Joint Infection.⁵

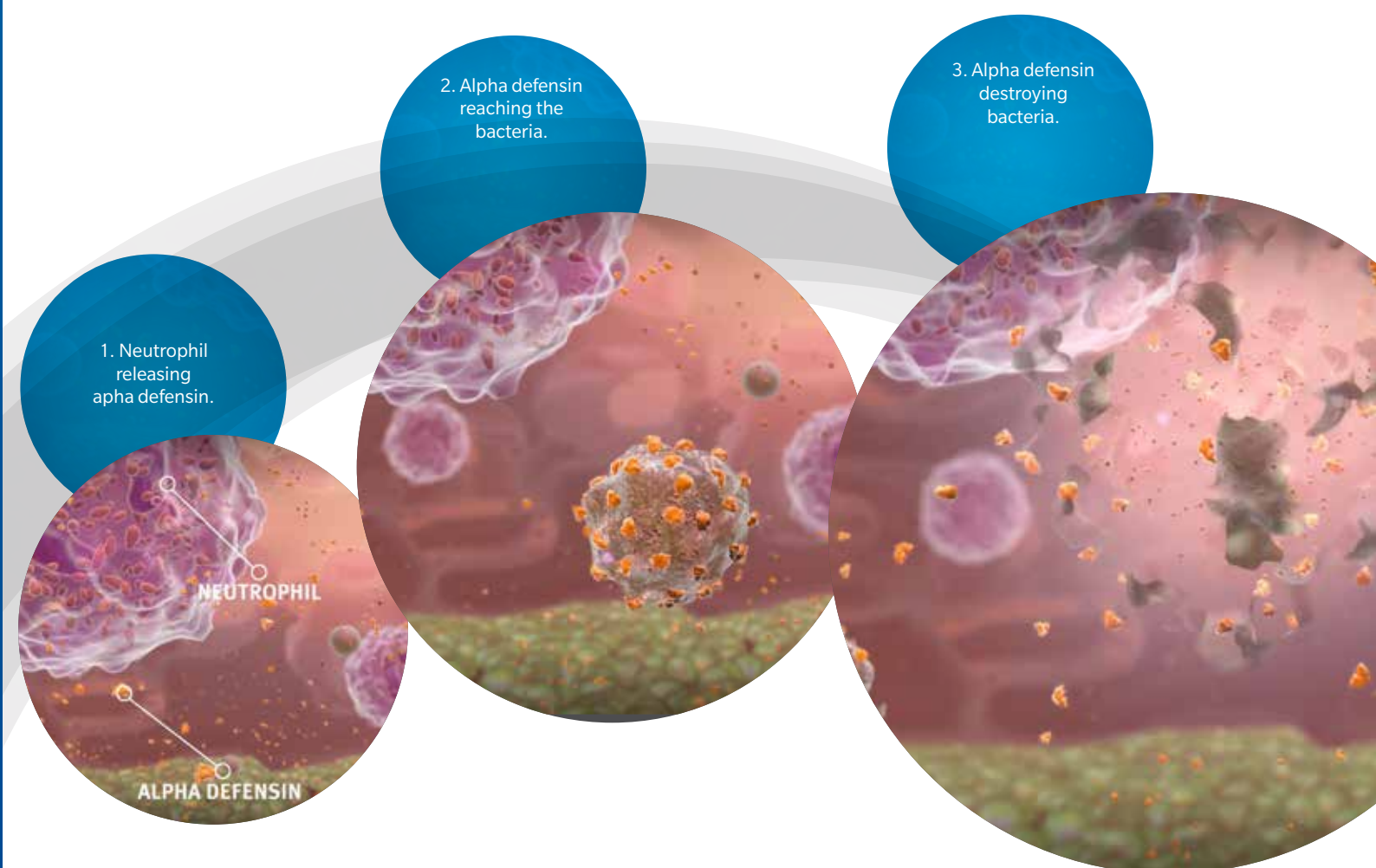
1. Neutrophil releasing alpha defensin.

NEUTROPHIL

ALPHA DEFENSIN

2. Alpha defensin reaching the bacteria.

3. Alpha defensin destroying bacteria.



Synovasure[®] Alpha Defensin Lateral Flow Test

Rapid Results in 10 Minutes

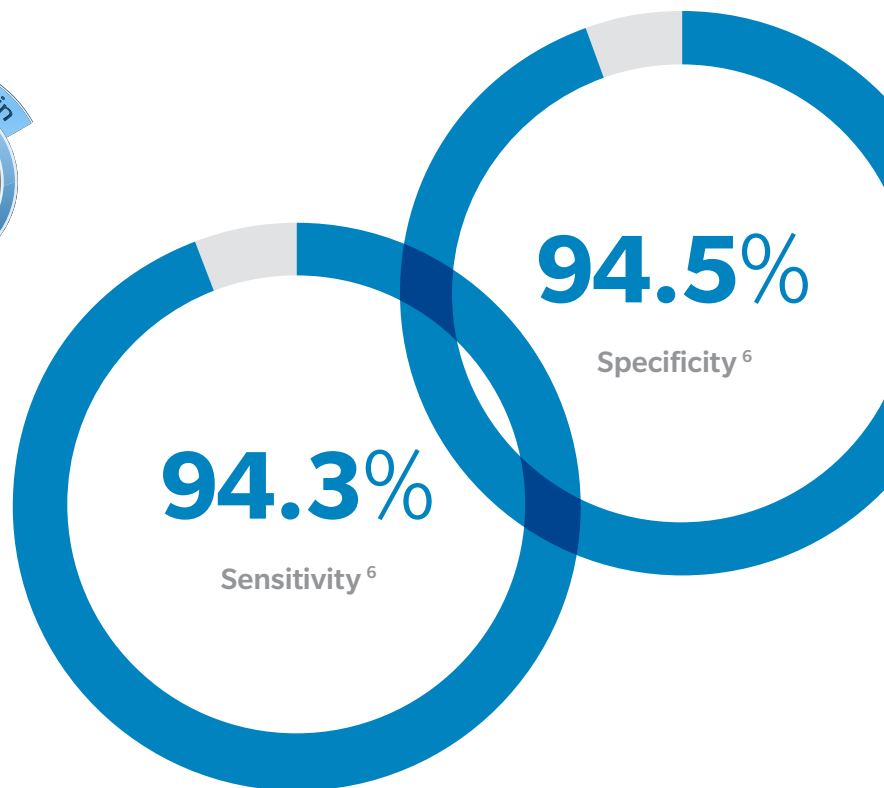
The Synovasure Alpha Defensin Lateral Flow Test is a standalone, rapid device for detecting alpha defensin in synovial fluid.

The first test of its kind, the Synovasure Alpha Defensin Lateral Flow Test offers physicians:

- 94.3% Sensitive and 94.5% Specific vs. standard of care criteria⁶
- Same-day results - Rapid Positive/Negative alpha defensin result in 10 minutes
- Low synovial fluid volume requirement – Only 15 microliters required for test performance
- Control kit availability for proficiency and validation

In a prospective clinical study (n=305), the Synovasure Alpha Defensin Lateral Flow Test demonstrated 94.3% Sensitivity and 94.5%* Specificity when compared to the standard of care criteria. Furthermore, no statistically significant difference was observed between the Synovasure Alpha Defensin Lateral Flow Test compared to the Synovasure Alpha Defensin ELISA.⁶

*Excluding samples with >20% blood dilution



Rapid Test Process

1 Allow fluid to reach the black fill line



2 Mix with buffer solution



3 Deposit onto device



4 Read results in 10-20 minutes



For complete step descriptions, please refer to the Instructions for Use (IFU)



BREAKING THE REVISION CYCLE

Synovasure Alpha Defensin Lateral Flow Test is one of many products that make up Zimmer Biomet's solutions of revision products and services.

It is time to break the revision cycle and focus on the entire patient journey. From diagnostics to patient specific re-implantation, we unite customizable, interconnected and interdependent services and solutions to address each unique episode of care.

In addition to the Synovasure Lateral Flow Test, Zimmer Biomet offers the Synovasure Comprehensive PJI Laboratory Tests Panel – together they offer physicians a wide variety of options to aid in the diagnosis of Periprosthetic Joint Infection (PJI).



From Diagnosis Aids to Re-implantation

Zimmer Biomet provides a comprehensive portfolio for the continuum of care.



Therapy

Once infection has been diagnosed, defeating the organism is vital. In conjunction with systemic antimicrobial antibiotic therapy (standard treatment approach to an infection), Zimmer Biomet's modular or monoblock cement spacer molds and lavage systems are designed to help meet these needs.

Re-implantation

After the infection has been diagnosed and treated, Zimmer Biomet provides antibiotic loaded cements and revision systems designed to restore joint function. Zimmer Biomet offers a wide range of revision implant systems for re-implantation.

To learn more about our Diagnostic product offerings for PJI, please contact your local Zimmer Biomet representative or visit www.zimmerbiomet.com

Intended Use

The Synovasure® Alpha Defensin Lateral Flow Test Kit is a qualitative, visually read immunochromatographic assay for the detection of human host response proteins, Alpha Defensins 1-3, in the synovial fluid of adults with a total joint replacement who are being evaluated for revision surgery. The Synovasure Alpha Defensin Lateral Flow Test Kit results are intended to be used in conjunction with other clinical and diagnostic findings to aid in diagnosis of periprosthetic joint infection (PJI). The Synovasure Alpha Defensin Lateral Flow Test Kit is not intended to identify the etiology or severity of a PJI.

The Synovasure Alpha Defensin Control Kit is used in the Synovasure Alpha Defensin Lateral Flow Test Kit as assayed quality control samples to monitor performance and reliability of the Synovasure Alpha Defensin Lateral Flow Test Kit.

This assay is for prescription use only in the United States and for laboratory use in Canada and Australia. For all countries outside of the United States, Canada, and Australia, this assay is for professional use only.

References

1. Diermengian C, et al. Diagnosing Periprosthetic Joint Infection: Has the Era of the Biomarker Arrived? *Clin Orthop Relat Res.* Nov;472(11):3254-62, 2014.
2. Diermengian C, et al. Combined Measurement of Synovial Fluid a-Defensin and C-reactive Protein Levels: Highly Accurate for Diagnosing Periprosthetic Joint Infection. *JBJS Am.* Sep 3;96(17):1439-45, 2014.
3. Shahi A, et al. The alpha-defensin Test for Periprosthetic Joint Infections is Not Affected by Prior Antibiotic Administration. *Clin Orthop Relat Res.* Jul;474(7):1610-5, 2016.
4. Diermengian C, et al. The C-reactive Protein May Not Detect Infections Caused by Less-Virulent Organisms. *Journal of Arthroplasty.* 31:152-155, 2016.
5. Amanatullah D, et al. Hip and Knee Section, Diagnosis, Definitions: Proceedings of International Consensus on Orthopedic Infections. *Journal of Arthroplasty.* 34(2019) S329eS337.
6. CDD-CLI-001: Clinical Validation of CD Diagnostics Synovasure PJI ELISA Test and Synovasure PJI Lateral Flow Test for Detection of Periprosthetic Joint Infection (PJI) in Synovial Fluid.

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Zimmer Biomet does not practice medicine. Each physician should exercise his or her own independent judgment in the diagnosis and treatment of an individual patient, and this information does not purport to replace the comprehensive training physicians have received.

This test has been developed for use with synovial fluid only. The use of this test kit with any other specimen type may lead to inaccurate test results.

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