



From The BioMed  
Article Library

© 2007 BioMed

This downloadable report is also available in paper format for the cover price of the report plus \$4 to cover reproduction and mailing. Visit Lyme-BookStore.com or call 801.925.2411 to order the printed version.

The purpose of this Instant Report is not to answer every question but to lead you to the sources for the answers. This is a growing document. It is not the last word; it is only the last word to date. It will be revised as new information is gathered in this fast-paced field. Please send your suggestions for corrections and additions.

#### Warning—Disclaimer

The information contained in this document is available for informational and educational purposes only. It is not intended to prevent, diagnose, treat, or cure disease. For medical advice, consult a licensed physician. The author of this report is not a licensed health care provider. Instead, the report expresses only the opinions and research results of unlicensed investigative journalist(s). This article is sold with the understanding that the publisher, authors, and advisors are not rendering medical or professional advice or service. We are not endorsing any of the referenced resources. The authors, advisors and publisher shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this report.

BioMed Publishing Group

P.O. Box 9012

South Lake Tahoe, CA 96150

Tel: (801) 925-2411

Fax: (530) 452-1970

[admin@lymebook.com](mailto:admin@lymebook.com)

<http://www.LymeBookStore.com>

# Everything You Always Wanted to Know About the CD-57 Test—But Were too Sick to Ask

Ginger Savely, RN, FNP-C

*Note: This report is easier to read and interact with if you print it.*

## Introduction by Bryan Rosner

Most people know that AIDS patients are constantly monitoring their CD-4 cell counts to determine their state of health. Similarly, according to recent research by Lyme Literate Medical Doctor (LLMD) Raphael B. Stricker, M.D., Lyme Disease sufferers also have a certain laboratory marker which should be closely monitored:



The CD-57 count, which measures a special population of Natural Killer (NK) white blood cells. Findings indicate that chronic Lyme Disease sufferers have a lower than healthy number of CD-57 NK cells. Testing for CD-57 NK cells can allow practitioners to not only determine if chronic Lyme Disease is a suspected diagnosis, but also determine how far along a patient is in their recovery process. As the patient recovers, the CD-57 count increases.

Standard guidelines indicate that a CD-57 count of 200 and above is normal. A score of less than 20 likely means that there is a serious, active case of Lyme Disease. Anywhere in between 20 and 200 is the grey area which can be interpreted as different degrees of sickness. Some researchers believe that those with a score higher than 60 are relatively Lyme-free, others think the number you want to be above is 100, and still others peg the target at 150 or above.

Regardless of where the threshold is, everyone agrees that the higher the CD-57, the better. Hence, this test is useful not only as an initial diagnostic tool, but also as an ongoing assessment of improvement, healing, and the efficacy of various therapies. One strategy for utilizing the test is to administer it once in the beginning of treatment, and then periodically throughout treatment to assess treatment success.

Lets dig deeper into the topic of the CD-57 test and examine an article written by Ginger Savely, RN, FNP-C.

## **Article by Ginger Savely, RN, FNP-C**

From coast to coast, frustrations abound among patients and clinicians regarding the diagnosis of chronic Lyme disease. Misinformed health care providers in Texas and surrounding states consider the infection rare and non-endemic. They are inclined to rule out Lyme disease based on the negative result of a laboratory test that, unbeknownst to them, is highly insensitive. In the absence of a reliable laboratory test or adequate experience in the recognition of the varied and complex presentations of the illness, most clinicians are ill-equipped to diagnose chronic Lyme disease. Many patients suffer needlessly for years, hopelessly lost in the maze of the health care system, looking for answers and enduring the skepticism of practitioners inexperienced with the disease's signs and symptoms.

What is needed is a better Lyme test or some other objective measure to persuade the practitioner to consider the diagnosis of chronic Lyme disease. Enter the CD57 test! You may have heard the term "CD57" tossed around on chat groups, or your Lyme-literate health care provider may have even explained the test to you in one of your moments of brain-fogged stupor. What is this number that sounds more like a type of Heinz ketchup than a lab test, and what in the world does it have to do with Lyme disease?

Let's start by going back to basic high school biology. You may remember that white blood cells (a.k.a. leukocytes) are the components of blood that help the body fight infections and other diseases. White blood cells can be categorized as either granulocytes or mononuclear leukocytes. Mononuclear leukocytes are further sub-grouped into monocytes and lymphocytes.

Lymphocytes, found in the blood, tissues and lymphoid organs, attack antigens (foreign proteins) in different ways. The main lymphocyte sub-types are B-cells, T-cells and natural killer (NK) cells. B-cells make antibodies that are stimulated by infection or vaccination. T-cells and NK cells, on the other hand, are the cellu-

lar aggressors in the immune system and are our main focus in the discussion that follows.

Let's pause a moment and introduce something you probably never learned about in high school biology class: CD markers. CD, which stands for "cluster designation", is a glycoprotein molecule on the cell surface that acts as an identifying marker. Think of comparing cells as comparing people. Humans are made up of innumerable superficial identifying characteristics (such as hair color, eye color, etc.) and so are cells. Cells have thousands of different identifying markers, or CDs, expressed on their surfaces, but 200 or so have been recognized and named so far.

Each different marker (or CD) on a cell is named with a number, which signifies nothing more than the order in which the CD was discovered. On any given cell there are many different cluster designation markers (CDs), giving each cell its unique appearance and function but also linking certain cells by their similarities (like grouping all people with brown hair or all people with blue eyes). Cells that have a certain kind of CD present on their surface are denoted as + for that CD type (e.g., a cell with CD57 markers on its surface is CD57+).

NK cells have their own specific surface markers. The predominant marker is CD56. The percentage of CD56+ NK cells is often measured in patients with chronic diseases as a marker of immune status: the lower the CD56 level, the weaker the immune system. You may have heard Chronic Fatigue Syndrome patients talk about their CD56 counts.

A smaller population of NK cells are CD57+. A below-normal count has been associated with chronic Lyme disease by the work of Drs. Raphael Stricker and Edward Winger. No one knows for sure why CD57+ NK cells are low in Lyme disease patients, but it is important to note that many disease states that are often confused with chronic Lyme (MS, systemic lupus, rheumatoid arthritis) are not associated with low CD57+ NK counts. The good news is that for most Lyme patients the CD57+ NK level increases as treatment progresses and health is regained.

CD57 markers can also be expressed on other kinds of cells, including T-cells, so it is important to distinguish between CD57+ T-cells and CD57+ NK cells. Clinicians need to be aware that many testing laboratories claiming to perform the CD57 test are actually looking at CD57+ T-cells rather than CD57+ NK cells, which are the cells of interest in chronic Lyme disease.

In order for a testing laboratory to measure the CD57+ NK level, it first measures the percentage of lymphocytes that are CD57+ NK cells. Then an absolute count is calculated by multiplying that percentage by the patient's total lymphocyte count. The standard normal range for the absolute CD57 NK count is 60 to 360 cells per microliter of blood. This wide range was established based upon test results of hundreds of healthy patients. By these laboratory standards, a test result below 60 cells per microliter would be considered below normal and therefore associated with chronic Lyme disease. However, a recent study of my Austin patients has led me to believe that 100 cells per microliter is a more reliable threshold separating Lyme patients and healthy controls.

When Drs Stricker and Winger discovered that CD57+ NK cells are low in chronic Lyme patients and tend to increase with patients' clinical improvement, an opportunity arose for Lyme-literate practitioners to utilize a handy tool to aid in the diagnosis of chronic Lyme disease, to follow treatment progress, and to determine treatment endpoint. Just as AIDS patients have always held great store in their CD4 T-cell count, Lyme patients now have a fairly reliable marker of the status of their illness.

It is important to remember that the CD57 result is just a number; far more important is the patient's clinical status. An old professor of mine used to say, "treat the patient, not the lab test!" There is still much we do not know about the CD57 marker and what other factors may lower or raise it. However, overall, the CD57+ NK count is a useful tool in diagnosing and treating chronic Lyme disease in most patients. As a measure of immune status, it provides an indirect measure of bacterial load and severity of illness. Furthermore, in a patient who has a negative or indeterminate Lyme test but is

highly suspect for the disease, the clinician may utilize the CD57+ NK count as one more piece in the complex puzzle of a Lyme disease diagnosis.

## **The Study**

Here is the abstract from Dr. Stricker's study, which was published by the Department of Medicine at the California Pacific Medical Center:

**Immunol Lett. 2001 Feb 1;76(1):43-8.**

**Decreased CD57 lymphocyte subset in patients with chronic Lyme disease.  
Stricker RB, Winger EE.**

**Department of Medicine, California Pacific Medical Center, 450 Sutter Street, Suite 1504, San Francisco, CA 94108, USA. rstricker@usmamed.com**

**BACKGROUND:** Chronic Lyme disease (LD) is a debilitating illness caused by tickborne infection with the spirochete *Borrelia burgdorferi*. Although immunologic abnormalities appear to play a role in this disease, specific immunologic markers of chronic LD have not been identified. **METHODS:** We evaluated 73 patients with chronic LD for lymphocyte subset abnormalities using flow cytometry. Of these, 53 patients had predominant musculoskeletal symptoms, while 20 patients had predominant neurologic symptoms. The estimated duration of infection ranged from 3 months to 15 years, and all patients had positive serologic tests for *B. burgdorferi*. Ten patients with acute LD (infection less than 1 month) and 22 patients with acquired immunodeficiency syndrome (AIDS) served as disease controls. **RESULTS:** All 31 chronic LD patients who were tested prior to antibiotic treatment had significantly decreased CD57 lymphocyte counts (mean, 30+/-16 cells per microl; normal, 60-360 cells per microl,  $P<0.001$ ). Nineteen of 37 patients (51%) who were tested after initiating antibiotic therapy had decreased CD57 levels (mean, 66+/-39 cells per microl), and all five patients tested after completing antibiotic treatment had normal CD57 counts (mean, 173+/-98 cells per mi-

crol). In contrast, all 10 patients with acute LD and 82% of AIDS patients had normal CD57 levels, and the difference between these groups and the pre-treatment patients with chronic LD was significant ( $P < 0.001$ ). Patients with chronic LD and predominant neurologic symptoms had significantly lower mean CD57 levels than patients with predominant musculoskeletal symptoms ( $30 \pm 21$  vs.  $58 \pm 37$  cells per microl,  $P = 0.002$ ). CD57 levels increased in chronic LD patients whose symptoms improved, while patients with refractory disease had persistently low CD57 counts.

**CONCLUSIONS:** A decrease in the CD57 lymphocyte subset may be an important marker of chronic LD. Changes in the CD57 subset may be useful to monitor the response to therapy in this disease. PMID: 11222912 [PubMed - indexed for MEDLINE]

## **Resources and Testing Information**

If you would like your health care provider to order the CD57 NK test for you, your blood sample needs to be drawn into an EDTA tube (lavender top) on Monday through Thursday and sent immediately to either LabCorp in Burlington, NC, or Clinical Pathology Laboratories (CPL) in Austin, TX. LabCorp and CPL are the only two labs that perform this test properly. Quest does NOT. The LabCorp test code is #505026 and is named HNK1 (CD57) Panel. The CPL test code is #4886, CD57 for Lyme disease. The test is time-sensitive and must be performed within 12 hours of collection, so blood should not be drawn on a Friday or results may be inaccurate.

For more thorough information on the testing procedure, see:

[www.anapsid.org/lyme/strickerpanel.html](http://www.anapsid.org/lyme/strickerpanel.html)

### **Notes:**

- 1. It is a challenge to keep up with changes in contact names, website links, and telephone numbers. If you have a correction, please send it to:**  
[admin@lymebook.com](mailto:admin@lymebook.com).

- 2. Throughout this report, you may have noticed website addresses containing "tinyurl.com." Tiny Url is a service for condensing long website addresses into smaller, more usable addresses, so these links will automatically transfer you to the appropriate pages. We used this service to make it easier for customers who may have printed this report and who wish to type website addresses into their browser manually.**

**Copyright © 2007  
Lyme Book Store.com**  
Innovative Resources for  
Patients and Practitioners.