TEST

B and T cell screen

A B and T cell screen is a blood test that counts major types of immune cells called lymphocytes.

WHAT IT MEASURES
Numbers and proportions of B cells and T cells

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
About 5 to 10 minutes

RESULTS IN
Usually 1 to 3 days; laboratory timing differs

USED FOR
Investigating immune disorders and monitoring treatment

MAIN LIMITATION
Counts can shift with illness, medicines, and sample delays

Overview

A B and T cell screen measures two major groups of white blood cells called lymphocytes. B cells make antibodies, while T cells coordinate immune responses and destroy some infected or abnormal cells.

The test usually uses flow cytometry . Cells are labelled with markers and passed through a machine that identifies and counts them. Common markers include CD3 for total T cells and CD19 or CD20 for B cells.

Some panels also measure CD4 helper T cells, CD8 cytotoxic T cells, and natural killer (NK) cells. The exact panel differs between laboratories.

This is not the same as routine newborn screening for severe combined immunodeficiency, which generally looks for signs of newly formed T cells.

Why the test is ordered

The test shows whether major lymphocyte groups are present in expected numbers and proportions. Reasons for ordering it include:

For people with HIV, a CD4 count may be ordered separately or included in a broader panel to assess immune function.

A B and T cell screen cannot by itself diagnose an immune disorder, HIV, leukemia, or lymphoma.

- Repeated, severe, persistent, or unusual infections
- A suspected inherited or acquired immune disorder
- Monitoring an immune condition or treatment
- Assessing recovery after chemotherapy or stem cell transplantation
- Investigating some blood cancers

Who should have the test

This is not usually a general health screening test. It may be offered after an abnormal complete blood count, particularly when the total lymphocyte count is unusually low or high. It can also help monitor conditions or treatments known to affect B cells or T cells.

Children can have the test, but their results require age-specific reference ranges. Whether testing is useful depends on your symptoms, medical history, medicines, and previous results.

How to prepare

You usually do not need to fast. You can normally eat, drink water, and take your usual medicines unless you have different instructions because other tests are being collected.

Tell your healthcare team about:

Do not stop prescribed medicine to change the result. For repeated testing, collecting blood at a similar time of day and point in your treatment cycle may make comparisons more useful.

- Prescription medicines, especially steroids like prednisone or hydrocortisone , chemotherapy, immunosuppressants, and immune-targeting treatments
- A recent infection, vaccination, operation, or hospital stay
- Pregnancy
- A recent blood transfusion

- A stem cell or organ transplant
- Strenuous exercise shortly before the test

What happens during the test

A healthcare professional cleans an area of skin and inserts a small needle into a vein, usually inside your elbow. Blood is collected into a tube. This takes a few minutes and may cause a brief scratch or sting.

Pressure is applied afterward to reduce bleeding and bruising. The sample must reach the laboratory under suitable conditions because delays or improper storage can damage living white blood cells.

Understanding your results

Results are commonly reported as an absolute count and a percentage . The absolute count estimates the number of cells in a volume of blood; the percentage shows how much of the lymphocyte population belongs to each group.

Your report may include:

A high or low result does not establish a diagnosis. Low counts can occur with acute illness, medicines, immune disorders, or immune-suppressing treatments. High counts may be temporary during an immune response or may require investigation for inflammation or a blood disorder.

Percentages can be misleading if another cell group is unusually high or low, so they should be considered with absolute counts. Reference ranges vary by laboratory, age, pregnancy status, medicines, and clinical circumstances. Trends may be more informative than one result.

- CD3 cells, representing most T cells
- CD4 helper T cells
- CD8 cytotoxic T cells
- CD19 or CD20 B cells
- A CD4-to-CD8 ratio
- NK cells, if included

What affects the results

A current or recent infection, vaccination, surgery, physical stress, or strenuous exercise can temporarily change lymphocyte counts. Time of day may also affect numbers, particularly when small changes are being monitored.

Corticosteroids, chemotherapy, anti-rejection medicines, and treatments targeting B cells or T cells can alter results. Pregnancy, age, recent transfusion, and stem cell transplantation may also affect interpretation.

Delayed transport, incorrect storage, clotting, or damaged cells can make a sample unreliable. The laboratory may reject an unsuitable or outdated sample.

Accuracy and limitations

Flow cytometry is generally reliable when the sample is fresh and the required markers are included. However, a limited panel detects only the cell groups it was designed to identify.

The test can miss disorders in which cell numbers are normal but the cells do not work properly. It does not directly show whether B cells make effective antibodies or T cells respond normally. Immunoglobulin measurements, vaccine-response tests, functional cell tests, or genetic tests may be needed.

Temporary changes caused by illness, stress, exercise, or treatment can produce an abnormal result that later returns to normal. A basic screen may also miss a small or unusual abnormal cell population. Suspected leukemia or lymphoma may require more detailed flow cytometry, a blood film, bone marrow testing, a biopsy, or molecular tests.

Risks and complications

The risks are those of an ordinary blood draw. You may have brief discomfort, a small bruise, or feel faint. Significant bleeding or infection at the needle site is uncommon.

What happens next

A result within the expected range may need no further action if your other tests and medical history are reassuring.

An unexpected result is usually compared with your complete blood count and previous measurements. Your healthcare team may repeat the test after an illness has resolved or at a

consistent point in a treatment cycle.

Further tests may include immunoglobulin levels, antibody-response tests, HIV testing when relevant, detailed flow cytometry, lymphocyte function tests, or genetic testing. Persistent or substantial abnormalities may require assessment by an immunology, infectious diseases, or hematology specialist.

The result itself is not an emergency. Contact your healthcare team promptly if you have a fever or signs of infection and have been told that your immune system is significantly weakened. Follow any personal temperature or emergency plan you were given. Seek emergency help for severe difficulty breathing, confusion, collapse, or other rapidly worsening symptoms rather than waiting for results.

Common questions

Can I drink coffee before the test?

Usually, yes, unless other fasting blood tests are being collected. Water is the best option for staying hydrated.

Does the time of day matter?

It can have a modest effect. For ongoing monitoring, collecting samples at a similar time may improve comparisons.

Can I exercise beforehand?

Gentle activity is unlikely to matter. Avoid strenuous exercise shortly before the test when practical because it can temporarily change lymphocyte counts.

Should I stop my medicines?

No, unless the clinician responsible for them tells you to. Stopping medicines can be unsafe. Give your healthcare team an accurate medicine list.

How is this different from a complete blood count?

A complete blood count measures total lymphocytes but does not usually separate them into B cells, T cells, and subgroups.

Will a normal result rule out an immune disorder?

No. Cell numbers can be normal even when cell function or antibody production is impaired. Further testing may be appropriate if your history suggests an immune problem.

Sources

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