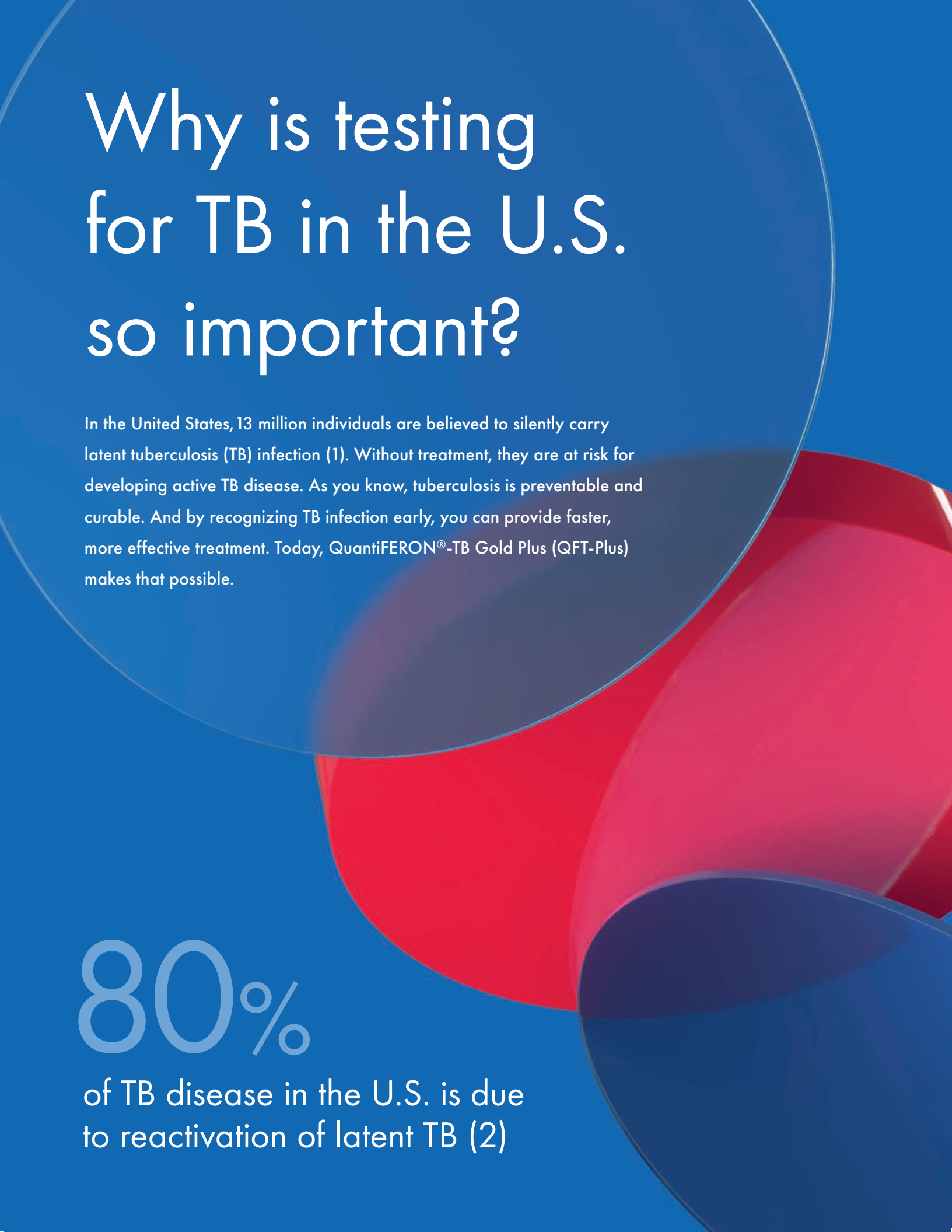
QuantiFERON®-TB Gold Plus

A new way to see tuberculosis

Meet the next evolution in TB detection.

Why is testing for TB in the U.S. so important?

In the United States, 13 million individuals are believed to silently carry latent tuberculosis (TB) infection (1). Without treatment, they are at risk for developing active TB disease. As you know, tuberculosis is preventable and curable. And by recognizing TB infection early, you can provide faster, more effective treatment. Today, QuantiFERON®-TB Gold Plus (QFT-Plus) makes that possible.



80%

of TB disease in the U.S. is due to reactivation of latent TB (2)

Today, we can do better for people with TB

Individuals at high risk for TB infection and disease progression require rapid, accurate testing. Early detection is critical to prevent the spread of the disease (3). Approximately 10% of those infected with latent TB will develop active TB at some point in their lifetime (4). The U.S. Centers for Disease Control and Prevention (CDC) identifies specific groups who are at higher risk for TB exposure and for progression to active TB (4). The increased risk of developing active TB for many of these at-risk groups has been quantified in an independent research meta-analysis (5).

Table 1. Individuals at increased risk of TB infection or TB progression (4)

Increased risk for TB infection	Increased risk for TB progression
Close contacts of active TB cases	Individuals living with HIV
Healthcare workers	Persons receiving TNF-α inhibitors
Foreign-born persons	Persons with diabetes mellitus
Persons in congregate settings	Persons with chronic renal failure
Persons in correctional facilities	Persons receiving corticosteroids
Persons in long-term care facilities	Organ transplant recipients
Persons who abuse drugs or alcohol	Persons recently infected with *M. tuberculosis*

Table 2. Groups at increased risk for developing active TB (5)

Risk group	Fold risk
HIV/AIDS	50–170
Transplant recipients	20–74
Hemodialysis	10–25
Recent TB infection	15
Abnormal chest X-ray	6–19
TNF-α inhibitors	2–9
Diabetes	2–5

The CDC recommends IGRAs, such as QFT-Plus, for the majority of the U.S. testing population

According to the CDC, interferon-gamma release assays (IGRAs) are preferred for TB testing in most risk groups, including (6):

- Those likely to be infected with TB
- Anyone with low or intermediate risk of disease progression
- Those for whom it has been decided that testing for latent TB infection is warranted

IGRAs are also **strongly recommended** in those who have received the BCG vaccine or are unlikely to return to have their tuberculin skin test (TST) read.

QFT-Plus is the modern solution for TB screening

QuantiFERON-TB Gold Plus is the next generation of the industry-leading IGRA for TB screening. QFT-Plus is optimized with innovative tuberculosis-specific antigens that elicit both CD8 and CD4 T cell responses – enabling a more comprehensive assessment of cell-mediated immune response to TB infection (7).

QuantiFERON-TB Gold Plus provides:

- Single-visit screening
- Highly accurate and reproducible results
- Convenient and objective lab-based testing
- Innovative CD8 T cell technology, providing a more comprehensive view of the immune response to TB infection
- Flexible blood collection and scalable laboratory workflows

Reduce the disease's impact by increasing your **ability to detect it**

Focused on efficiency, accuracy, and moving the world of science and health forward

Simplicity

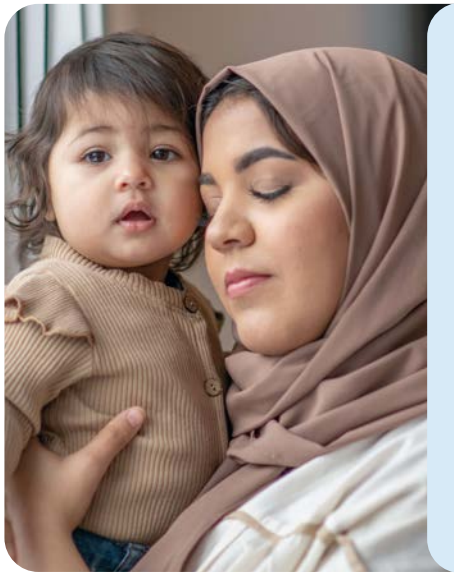
- Requires only 1 visit to the provider
- Provides 97% test specificity, reducing false positive results
- Provides 94% sensitivity for TB infection, allowing patients to receive treatment faster
- Elicits both CD8 and CD4 T cell responses
- Reduces unnecessary treatment – unaffected by the BCG vaccine and most non-TB mycobacteria

Customized and optimized workflow

- Four individual tube results are combined in a single qualitative result, indicating the immune response to *Mycobacterium tuberculosis*
- Fast turnaround time
- Objective processing and results interpretation

Cost-effective testing

- Low false positive rate reduces the cost and burden of unnecessary X-rays and treatment
- Single-visit testing streamlines care and reduces costs
- Results are sent directly to providers, eliminating return visits for patients who test negative and encouraging follow-up for patients who test positive
- QFT-Plus testing is covered by the majority of health insurance carriers



A disease that hasn't changed – in a world that drastically has – must be looked at **differently**

A giant step toward eradicating TB with just one test, one visit and one clear result

The QFT-Plus test uses a peptide cocktail simulating *M. tuberculosis* proteins to stimulate cells in heparinized whole blood. Detection of interferon-γ (IFN-γ) by enzyme-linked immunosorbent assay (ELISA) is used to identify in vitro responses to these peptide antigens that are associated with *M. tuberculosis* infection.

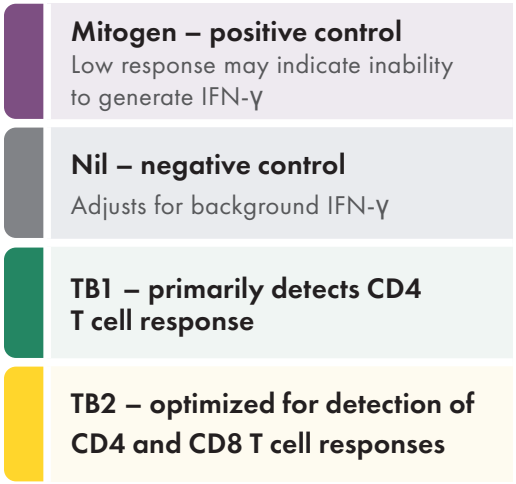


Figure 1.
QFT-Plus Blood Collection Tubes.

Requires just 4 ml of whole blood—1 ml in each of the four tubes

- Unique blood collection tubes enable immediate exposure of blood lymphocytes to highly specific TB antigens
- Option of drawing blood into a standard lithium-heparin tube
- Fastest and easiest IGRA available, with no tedious lymphocyte isolation, subjective cell counting, diluting, or culturing
- Easily scalable for high-throughput testing laboratories

Results interpretation

QFT-Plus assay results are interpreted objectively using optional QuantiFERON-TB Gold Plus analysis software.

QFT-Plus positive	QFT-Plus negative	QFT-Plus indeterminate
M. tuberculosis **infection is likely**	***M. tuberculosis*** **infection is NOT likely**	**Likelihood of *M. tuberculosis* infection cannot be determined**
- Nil ≤8.0; and - TB1 and/or TB2 minus Nil ≥0.35 and ≥25% of Nil	- Nil ≤8.0, Mitogen minus Nil ≥0.5; and - TB1 and TB2 minus Nil <0.35 or ≥0.35 and <25% of Nil	- Nil >8.0; or - Nil ≤8.0 and TB1 and TB2 <0.35 or ≥0.35 and <25% of Nil and Mitogen minus Nil <0.5

Figure 2.
Interpretation of results. All values are IU/ml IFN-γ. Indeterminate results may relate to the immune status of the individual being tested, or may be related to technical factors (e.g., incomplete ELISA plate washing). **Important:** Diagnosing or excluding tuberculosis disease and assessing the probability of latent TB infection requires a combination of epidemiological, historical, medical, and diagnostic findings that should be taken into account when interpreting QFT-Plus results (7).

A passion for progress meets a need for TB patients everywhere

QFT-Plus leads the industry with innovative CD8 technology

During *M. tuberculosis* infection, CD4 T cells play a critical role in immunological control through their secretion of the cytokine IFN-γ. Evidence now also supports a role for CD8 T cells in host defense against *M. tuberculosis*. CD8 T cells produce IFN-γ and other soluble factors to (8-10):

- **Suppress *M. tuberculosis* growth**
- **Kill infected cells**
- **Lyse intracellular mycobacteria**

Moreover, TB-specific CD8 T cells that produce IFN-γ have been:

- Detected more frequently in those with active TB disease vs latent infection (11-12)
- Associated with recent exposure to TB (13)
- Detectable in active TB subjects with HIV co-infection and in young children (14-16)

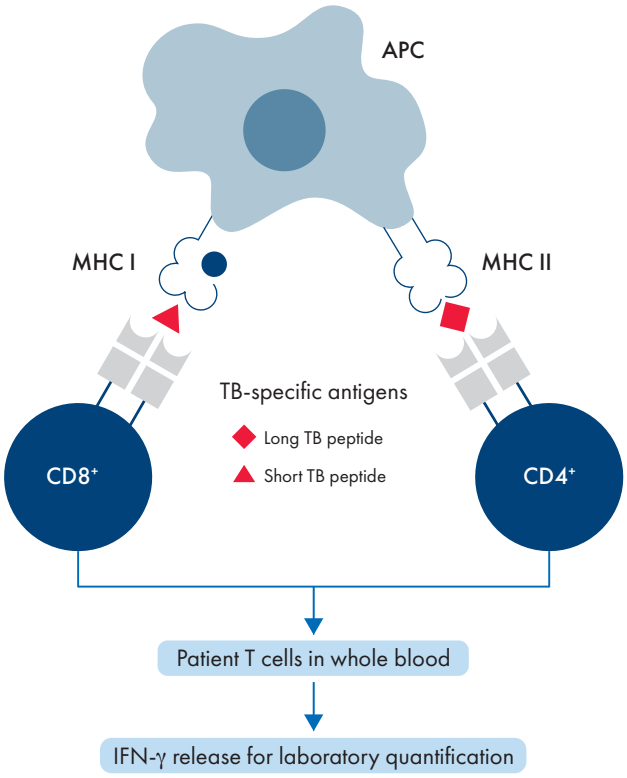
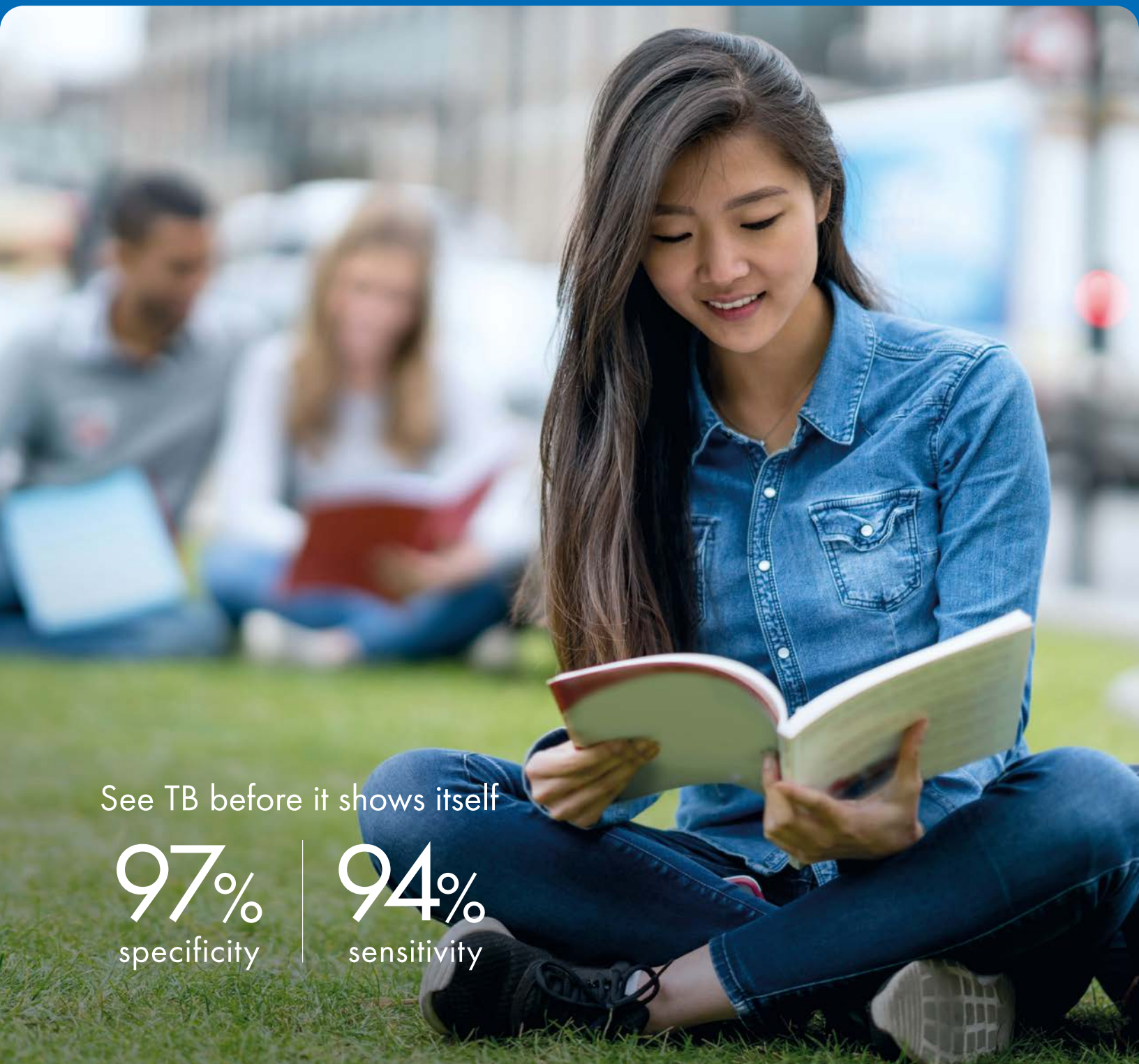


Figure 3.
QFT-Plus IGRA technology. APC, antigen-presenting cell; MHC, major histocompatibility complex.

Continuously dedicated to making **improvements in life** possible

The QFT-Plus difference



See TB before it shows itself

97% specificity | **94%** sensitivity

Positively accurate

QuantiFERON-TB Gold Plus is the patient-centered, more affordable way to test for TB infection – producing more accurate results than the century-old TST.

Table 3. QFT-Plus accurately identifies TB infection

TST challenges	QFT-Plus solutions
Specificity is as low as 59% in BCG-vaccinated patients (17)	>97% specific, nearly eliminating false positive results and providing peace of mind for patients and physicians
Low sensitivity can cause missed true positives, putting contacts at risk (18)	>94% sensitivity enables truly infected patients to be identified and to receive appropriate antibiotic therapy
Cross-reaction with the BCG vaccine and other environmental mycobacteria cause false positive results (7)	Unaffected by the BCG vaccine and most non-TB mycobacteria, reducing unnecessary antibiotic treatments

Patient-centered and cost-effective

QFT-Plus removes the costly burden that inaccurate TB screening results place on your practice and patients. And it is widely covered by Medicare, Medicaid, and private insurance.

Table 4. QFT-Plus provides single-visit, cost-effective testing

TST challenges	QFT-Plus solutions
High false positive rate causes unnecessary additional testing and costly treatment (18)	Low false positive rate reduces the cost and burden of unnecessary antibiotic treatment
High program costs result from second visits, unnecessary X-rays, and treatment	QFT-Plus is consistently shown to be more cost effective in screening situations (19, 20)
A return visit is required to read the TST reaction	Results can be sent directly to the physician, eliminating return visits for patients who test negative and encouraging follow-up for patients who test positive

From a century-old skin test to a faster, modern-day, fully optimized blood test

QFT-Plus offers industry-leading flexible blood collection options

QFT-Plus employs standard phlebotomy procedures using whole blood to make sample collection easy and fast. Sample incubation can occur on-site or at the testing laboratory, providing your practice with complete flexibility and convenience.

Option 1: Direct Draw

Collect 1 ml of whole blood directly into each of the four QFT-Plus blood collection tubes and hold at room temperature for up to 16 hours prior to incubation.

Option 2: Single Lithium-Heparin Tube

Draw at least 5 ml of blood into a single blood collection tube containing lithium-heparin as the anticoagulant. Blood collected into a single lithium-heparin tube may be stored at room temperature or refrigerated, allowing up to 53 hours prior to sample incubation.

Driven by the potential of **what's possible**

A scalable workflow made for today

QFT-Plus is the fastest and easiest IGRA available, with no tedious lymphocyte isolation, subjective cell counting, diluting, or culturing. **Results can be available using QFT-Plus analysis software within 24 hours, with no second patient visit required.**

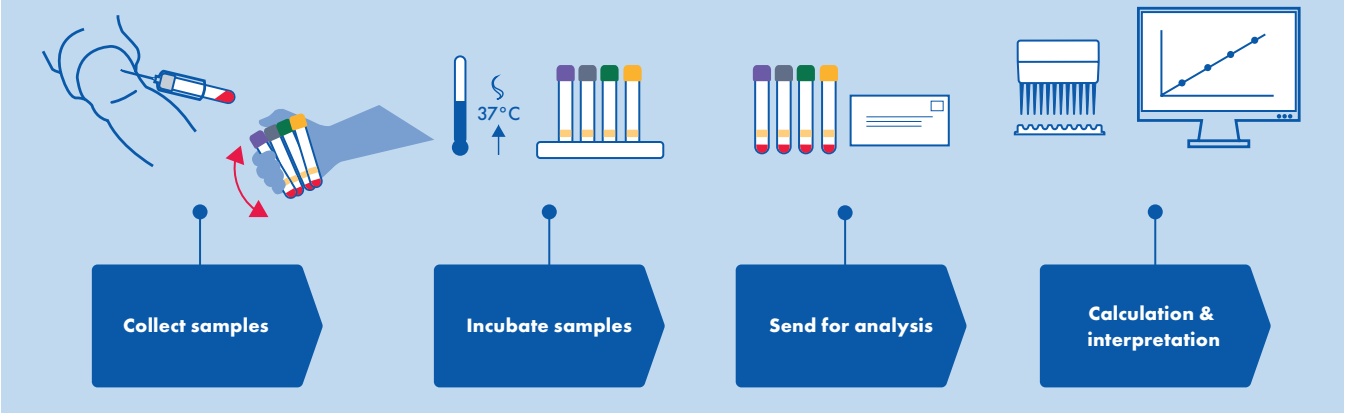


Figure 4.
Streamlined QFT-Plus workflow, from patient sample to diagnostic insight.

Choose the most tested and trusted IGRA available

QuantiFERON technology has been the subject of over 1500 clinical and scientific studies. QFT-Plus provides a comprehensive view of the immune response to TB infection – and the convenience of a single patient visit. To learn more, contact your QIAGEN sales representative, or visit **www.qiagen.com/endtb**.

Ordering Information

Product	Contents	Cat. no.
QuantiFERON-TB Gold Plus 2 Plate Kit ELISA	Microplate Strips; IFN-γ Standard, lyophilized; Green Diluent; Conjugate 100x Concentrate, lyophilized; Wash Buffer 20x Concentrate; Enzyme Substrate Solution; Enzyme Stopping Solution	622130
QFT-Plus Dispenser Pack (25 CT)	25 QFT-Plus Blood Collection Tubes pack, each including: Nil, TB1, TB2, and Mitogen tubes	622433
QFT-Plus Blood Collection Tubes (50X)	QFT-Plus Blood Collection Tubes: Nil, TB1, TB2, and Mitogen tubes (50 each)	622536

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