



ARCHITECT

SYSTEM

en

TSH

REF 7K62
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B7K620

Read Highlighted Changes
Revised June, 2010


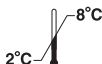


TSH



Customer Service: Contact your local representative or find country specific contact information on www.abbottdiagnostics.com.

Package insert instructions must be carefully followed. Reliability of assay results cannot be guaranteed if there are any deviations from the instructions in this package insert.

Key to symbols used

REF	List Number	REAGENT LOT	Reagent Lot
IVD	<i>In Vitro</i> Diagnostic Medical Device	CAL 1	Calibrator (1, 2)
SN	Serial Number	CONTROL L	Control Low, Medium, High (L, M, H)
LOT	Lot Number	ASSAY CD-ROM	Assay CD-ROM
	Expiration Date	REACTION VESSELS	Reaction Vessels
	Store at 2-8°C	SAMPLE CUPS	Sample Cups
	Consult instructions for use	SEPTUM	Septum
	Manufacturer	REPLACEMENT CAPS	Replacement Caps
		WARNING: SEVERE IRRITANT	Warning: Severe Irritant

See **REAGENTS** section for a full explanation of symbols used in reagent component naming.

NAME

ARCHITECT TSH

INTENDED USE

The ARCHITECT TSH assay is a Chemiluminescent Microparticle Immunoassay (CMIA) for the quantitative determination of human thyroid stimulating hormone (TSH) in human serum and plasma.

SUMMARY AND EXPLANATION OF TEST

Human Thyroid Stimulating Hormone (TSH) or thyrotropin is a glycoprotein with a molecular weight of approximately 28,000 daltons, synthesized by the basophilic cells (thyrotropes) of the anterior pituitary.¹ TSH is composed of two non-covalently linked subunits designated alpha and beta. Although the alpha subunit of TSH is common to the luteinizing hormone (LH), follicle stimulating hormone (FSH) and human chorionic gonadotropin (hCG), the beta subunits of these glycoproteins are hormone specific and confer biological as well as immunological specificity. Both alpha and beta subunits are required for biological activity.¹ TSH stimulates the production and secretion of the metabolically active thyroid hormones, thyroxine (T_4) and triiodothyronine (T_3), by interacting with a specific receptor on the thyroid cell surface.² T_3 and T_4 are responsible for regulating diverse biochemical processes throughout the body which are essential for normal development and metabolic and neural activity.

The synthesis and secretion of TSH is stimulated by thyrotropin releasing hormone (TRH), the hypothalamic tripeptide, in response to low levels of circulating thyroid hormones.^{3,4} Elevated levels of T_3 and T_4 suppress the production of TSH via a classic negative feedback mechanism. Other evidence also indicates that somatostatin and dopamine exert inhibitory control over TSH release, suggesting that the hypothalamus may provide both inhibitory and stimulatory influence on pituitary TSH production.⁵ Failure at any level of regulation of the hypothalamic-pituitary-thyroid axis will result in either underproduction (hypothyroidism) or overproduction (hyperthyroidism) of T_4 and/or T_3 .

In cases of primary hypothyroidism, T_3 and T_4 levels are low and TSH levels are significantly elevated.⁶ In the case of pituitary dysfunction, either due to intrinsic hypothalamic or pituitary disease; i.e., central hypothyroidism, normal or marginally elevated basal TSH levels are often seen despite significant reduction in T_4 and/or T_3 levels. These inappropriate TSH values are due to a reduction in TSH bioactivity which is frequently observed in such cases. Routine TRH stimulation is advised to confirm the diagnosis in such cases. Secondary hypothyroidism typically results in an impaired TSH response to TRH, while in tertiary hypothyroidism the TSH response to TRH may be normal, prolonged or exaggerated.⁷⁻⁹

Primary hyperthyroidism (e.g., Grave's Disease, nodular goiter) is associated with high levels of thyroid hormones and depressed or undetectable levels of TSH.¹⁰ The TRH stimulation test has been used in diagnosis of hyperthyroidism. Hyperthyroid patients show a subnormal response to the TRH test.¹¹ In addition, large doses of glucocorticoids, somatostatin, dopamine and replacement doses of thyroid hormones reduce or totally blunt the TSH response to TRH.^{11,12}

Earlier assays for serum TSH lacked the sensitivity to be used as a primary test of thyroid function.¹³ Sensitive TSH assays now available, with increased ability to clearly distinguish between euthyroid and hyperthyroid populations, are changing thyroid function testing. Analytical sensitivity, as a means of assessing low concentration accuracy, is being replaced by functional sensitivity.¹⁴ The American Thyroid Association has formally recommended the use of functional sensitivity as the means to quantify the sensitivity of TSH assays,¹⁵ although analytical sensitivity is still widely used. Third generation TSH assays exhibit 20% interassay CVs at < 0.02 μ U/mL and are useful in the discrimination of patients with true hyperthyroidism from those with TSH suppression seen in subclinical hyperthyroidism and some non-thyroidal illnesses.¹⁶ Other thyroid tests (Free T_4 estimate, Total T_4 , T-Uptake, and Total T_3) combined with the ability to accurately measure low levels of TSH, improve the efficiency of thyroid diagnosis.¹⁷

The ARCHITECT TSH assay is used as an aid in the assessment of thyroid status, diagnosis of thyroid disease, and treatment of thyroid disease.

BIOLOGICAL PRINCIPLES OF THE PROCEDURE

The ARCHITECT TSH assay is a two-step immunoassay to determine the presence of thyroid stimulating hormone (TSH) in human serum and plasma using Chemiluminescent Microparticle Immunoassay (CMIA) technology with flexible assay protocols, referred to as Chemiflex.

In the first step, sample, anti- β TSH antibody coated paramagnetic microparticles and TSH Assay Diluent are combined. TSH present in the sample binds to the anti-TSH antibody coated microparticles. After washing, anti- α TSH acridinium labeled conjugate is added in the second step. Pre-Trigger and Trigger Solutions are then added to the reaction mixture; the resulting chemiluminescent reaction is measured as relative light units (RLUs). A direct relationship exists between the amount of TSH in the sample and the RLUs detected by the ARCHITECT *i* optical system.

For additional information on system and assay technology, refer to the ARCHITECT System Operations Manual, Section 3.

REAGENTS

Reagent Kit, 100 Tests/500 Tests

NOTE: Some kit sizes are not available in all countries or for use on all ARCHITECT *i* Systems. Please contact your local distributor.

ARCHITECT TSH Reagent Kit (7K62)

- **MICROPARTICLES** 1 or 4 Bottle(s) (6.6 mL/27.0 mL) Anti- β TSH (mouse, monoclonal) coated Microparticles in TRIS buffer with protein (bovine) stabilizers. Preservative: antimicrobial agents.
- **CONJUGATE** 1 or 4 Bottle(s) (5.9 mL/26.3 mL) Anti- α TSH (mouse, monoclonal) acridinium-labeled Conjugate in MES buffer with protein (bovine) stabilizers. Minimum concentration: 60 ng/mL. Preservative: antimicrobial agent.
- **ASSAY DILUENT** 1 or 4 Bottle(s) (8.0 mL/40.7 mL) TSH Assay Diluent in TRIS buffer. Preservative: antimicrobial agents.

Manual Diluent

ARCHITECT *i* Multi-Assay Manual Diluent (7D82-50)

- **MULTI-ASSAY MANUAL DILUENT** 1 Bottle (100 mL) ARCHITECT *i* Multi-Assay Manual Diluent containing phosphate buffered saline solution. Preservative: antimicrobial agent.

Other Reagents

ARCHITECT *i* Pre-Trigger Solution

- **PRE-TRIGGER SOLUTION** Pre-Trigger Solution containing 1.32% (w/v) hydrogen peroxide.

ARCHITECT *i* Trigger Solution

- **TRIGGER SOLUTION** Trigger Solution containing 0.35N sodium hydroxide.

ARCHITECT *i* Wash Buffer

NOTE: Bottle and volume varies based on order.

- **WASH BUFFER** Wash Buffer containing phosphate buffered saline solution. Preservatives: antimicrobial agents.

WARNINGS AND PRECAUTIONS

- **IVD**
- For *In Vitro* Diagnostic Use
- Package insert instructions must be carefully followed. Reliability of assay results cannot be guaranteed if there are any deviations from the instructions in this package insert.

Safety Precautions

- **CAUTION:** This product may require the handling of human specimens. It is recommended that all human sourced materials be considered potentially infectious and handled in accordance with the OSHA Standard on Bloodborne Pathogens¹⁸. Biosafety Level 2¹⁹ or other appropriate biosafety practices^{20,21} should be used for materials that contain or are suspected of containing infectious agents.

The following warnings and precautions apply to this component:

- Assay Diluent



WARNING:	Contains Tris Hydroxymethyl Aminomethane and Tromethamine Hydrochloride.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
Prevention	
P264	Wash hands thoroughly after handling
P280	Wear protective gloves / protective clothing / eye protection.
P261	Avoid breathing mist / vapours / spray.
P271	Use only outdoors or in a well-ventilated area.

Response	
P305+P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice / attention.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P332+P313	If skin irritation occurs: Get medical advice / attention.
P362	Take off contaminated clothing and wash before reuse.
P304+340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
Storage	
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.


This material and its container must be disposed of in a safe way.

- For a detailed discussion of safety precautions during system operation, refer to the ARCHITECT System Operations Manual, Section 8.

Handling Precautions

- Do not use reagent kits beyond the expiration date.
- Do not mix reagents from different reagent kits.**
- Prior to loading the ARCHITECT TSH Reagent Kit on the system for the first time, the microparticle bottle requires mixing to resuspend microparticles that have settled during shipment. For microparticle mixing instructions, refer to the **PROCEDURE, Assay Procedure** section of this package insert.
- Septums MUST be used to prevent reagent evaporation and contamination and to ensure reagent integrity. Reliability of assay results cannot be guaranteed if septums are not used according to the instructions in this package insert.**
- To avoid contamination, wear clean gloves when placing a septum on an uncapped reagent bottle.
- Once a septum has been placed on an open reagent bottle, **do not invert the bottle** as this will result in reagent leakage and may compromise assay results.
- Over time, residual liquids may dry on the septum surface. These are typically dried salts which have no effect on assay efficacy.
- For a detailed discussion of handling precautions during system operation, refer to the ARCHITECT System Operations Manual, Section 7.

Storage Instructions

-  The ARCHITECT TSH Reagent Kit must be stored at 2-8°C and may be used immediately after removal from 2-8°C storage.
- When stored and handled as directed, reagents are stable until the expiration date.
- The ARCHITECT TSH Reagent Kit may be stored on-board the ARCHITECT *i* System for a maximum of 30 days. After 30 days, the reagent kit must be discarded. For information on tracking on-board time, refer to the ARCHITECT System Operations Manual, Section 5.
- Reagents may be stored on or off the ARCHITECT *i* System. If reagents are removed from the system, store them at 2-8°C (with septums and replacement caps) in an upright position. For reagents stored off the system, it is recommended that they be stored in their original trays and boxes to ensure they remain upright. **If the microparticle bottle does not remain upright (with a septum installed) while in refrigerated storage off the system, the reagent kit must be discarded.** After reagents are removed from the system, you must initiate a scan to update the on-board stability timer.

Indications of Reagent Deterioration

When a control value is out of the specified range, it may indicate deterioration of the reagents or errors in technique. Associated test results may be invalid and may require retesting. Assay recalibration may be necessary. For troubleshooting information, refer to the ARCHITECT System Operations Manual, Section 10.

INSTRUMENT PROCEDURE

- The ARCHITECT TSH assay file must be installed on the ARCHITECT *i* System from the ARCHITECT *i* Assay CD-ROM prior to performing the assay. For detailed instructions on assay file installation, refer to the ARCHITECT System Operations Manual, Section 2.
- For a detailed description of system procedures, refer to the ARCHITECT System Operations Manual.
- The default result unit for the ARCHITECT TSH assay is $\mu\text{U/mL}$. An alternate result unit, mIU/L , may be selected for reporting results by editing assay parameter "Result concentration units", to mIU/L . The conversion factor used by the system is 1.

SPECIMEN COLLECTION AND PREPARATION FOR ANALYSIS

- Human serum (including serum collected in serum separator tubes) or plasma collected in lithium heparin, sodium heparin, or potassium EDTA anticoagulant tubes may be used in the ARCHITECT TSH assay. Other anticoagulants have not been validated for use with the ARCHITECT TSH assay.
- Follow these package insert instructions as well as the specimen collection tube manufacturer's instructions for specimen collection and preparation for analysis. Refer to the specimen collection tube manufacturer's instructions for centrifugation time and speed.**
- Insufficient processing of sample, or disruption of the sample during transportation may cause depressed results.**
- For optimal results, serum and plasma specimens should be free of fibrin, red blood cells, or other particulate matter. Centrifuge specimens containing fibrin, red blood cells, or particulate matter prior to use to ensure consistency in the results.**
- Ensure that complete clot formation in serum specimens has taken place prior to centrifugation. Some specimens, especially those from patients receiving anticoagulant or thrombolytic therapy may exhibit increased clotting time. If specimens are centrifuged before a complete clot forms, the presence of fibrin or particulate matter may cause erroneous results. Centrifuge specimens containing fibrin, red blood cells, or particulate matter. Note that interfering levels of fibrin may be present in samples that do not have obvious or visible particulate matter.**
- If proper specimen collection and preparation cannot be verified, or if samples have been disrupted due to transportation or sample handling, an additional centrifugation step is recommended. Centrifugation conditions should be sufficient to remove particulate matter. Aliquots poured versus pipetted from specimen tube types that do not include serum separators are at higher risk of including particulates and generating depressed results.**
- Failure to follow these instructions may result in depressed specimen results.**
- If testing will be delayed more than 24 hours, remove serum or plasma from the clot, serum separator or red blood cells. Specimens may be stored for up to 7 days at 2-8°C prior to being tested. If testing will be delayed more than 7 days, specimens should be frozen at -10°C or colder. Specimens stored frozen at -10°C or colder for 6 months showed no performance difference.
- The ARCHITECT *i* System does not provide the capability to verify specimen type. It is the responsibility of the operator to verify the correct specimen types are used in the ARCHITECT TSH assay.
- Use caution when handling patient specimens to prevent cross contamination. Use of disposable pipettes or pipette tips is recommended.
- For optimal results, inspect all samples for bubbles. Remove bubbles with an applicator stick prior to analysis. Use a new applicator stick for each sample to prevent cross contamination.

- Multiple freeze-thaw cycles of specimens should be avoided. Specimens must be mixed THOROUGHLY after thawing, by LOW speed vortexing or by gently inverting, and centrifuged prior to use to remove red blood cells or particulate matter to ensure consistency in the results.
- When shipped, specimens must be packaged and labeled in compliance with applicable state, federal and international regulations covering the transport of clinical specimens and infectious substances. Specimens may be shipped ambient or under thermally controlled refrigerated conditions. Prior to shipment, it is recommended that specimens be removed from the clot, serum separator or red blood cells.

PROCEDURE

Materials Provided

- 7K62 ARCHITECT TSH Reagent Kit

Materials Required but not Provided

- ARCHITECT *i* System
- ARCHITECT *i* **ASSAY CD-ROM**
- 7K62-01 ARCHITECT TSH Calibrators
- 7K62-10 ARCHITECT TSH Controls
- 7D82-50 ARCHITECT *i* Multi-Assay Manual Diluent
- ARCHITECT *i* **PRE-TRIGGER SOLUTION**
- ARCHITECT *i* **TRIGGER SOLUTION**
- ARCHITECT *i* **WASH BUFFER**
- ARCHITECT *i* **REACTION VESSELS**
- ARCHITECT *i* **SAMPLE CUPS**
- ARCHITECT *i* **SEPTUM**
- ARCHITECT *i* **REPLACEMENT CAPS**
- For information on materials required for maintenance procedures, refer to the ARCHITECT System Operations Manual, Section 9.
- Pipettes or pipette tips (optional) to deliver the volumes specified on the patient or control order screen.

Assay Procedure

- Before loading the ARCHITECT TSH Reagent Kit on the system for the first time, the microparticle bottle requires mixing to resuspend microparticles that have settled during shipment:
 - Invert the microparticle bottle 30 times.
 - Visually inspect the bottle to ensure microparticles are resuspended. If microparticles are still adhered to the bottle, continue to invert the bottle until the microparticles have been completely resuspended.
 - Once the microparticles have been resuspended, remove and discard the cap. Wearing clean gloves, remove a septum from the bag. Carefully snap the septum onto the top of the bottle.
 - **If the microparticles do not resuspend, DO NOT USE. Contact your local Abbott representative.**
- Order tests.
- Load the ARCHITECT TSH Reagent Kit on the ARCHITECT *i* System. Verify that all necessary assay reagents are present. Ensure that septums are present on all reagent bottles.
- The minimum sample cup volume is calculated by the system and is printed on the Orderlist report. No more than 9 replicates may be sampled from the same sample cup. To minimize the effects of evaporation verify adequate sample cup volume is present prior to running the test.
 - Priority: 200 μ L for the first TSH test plus 150 μ L for each additional TSH test from the same sample cup
 - \leq 3 hours onboard: 200 μ L for the first TSH test plus 150 μ L for each additional TSH test from the same sample cup
 - $>$ 3 hours onboard: additional sample volume is required. Refer to the ARCHITECT System Operations Manual, Section 5 for information on sample evaporation and volumes.
- If using primary or aliquot tubes, use the sample gauge to ensure sufficient patient specimen is present.
- ARCHITECT TSH Calibrators and Controls should be mixed by gentle inversion prior to use.
- To obtain the recommended volume requirements for the ARCHITECT TSH Calibrators and Controls, hold the bottles **vertically** and dispense 6 drops of each calibrator or 4 drops of each control into each respective sample cup.

- Load samples
 - For information on loading samples, refer to the ARCHITECT System Operations Manual, Section 5
- Press RUN. The ARCHITECT *i* System performs the following function:
 - Moves the sample to the aspiration point
 - Loads a reaction vessel (RV) into the process path
 - Aspirates and transfers sample into the RV
 - Advances the RV one position and transfers microparticles and diluent into the RV
 - Mixes, incubates and washes the reaction mixture
 - Adds conjugate to the RV
 - Mixes, incubates and washes the reaction mixture
 - Adds Pre-Trigger and Trigger Solutions
 - Measures chemiluminescent emission to determine the quantity of TSH in the sample
 - Aspirates contents of RV to liquid waste and unloads RV to solid waste
 - Calculates the result
- For information on ordering patient specimens, calibrators and controls, and general operating procedures refer to the ARCHITECT System Operations Manual, Section 5.
- For optimal performance, it is important to follow the routine maintenance procedures defined in the ARCHITECT System Operations Manual, Section 9. If your laboratory requires more frequent maintenance, follow those procedures.

Specimen Dilution Procedures

Specimens with a TSH value exceeding 100.0000 μ U/mL, are flagged with the code ">100.0000" and may be diluted with either the Automated Dilution Protocol or the Manual Dilution Procedure.

- If using the Automated Dilution Protocol, the system performs a 1:5 dilution of the specimen and automatically calculates the concentration of the diluted specimen and reports the result.
- Manual dilutions should be performed as follows:
 - The suggested dilution for TSH is 1:10. It is recommended dilutions not exceed 1:10.
 - For example, to perform a 1:10 dilution, add 30 μ L of the patient specimen to 270 μ L of ARCHITECT *i* Multi-Assay Manual Diluent (7D82-50).
 - The operator must enter the dilution factor in the patient or control order screen. The system will use this dilution factor to automatically calculate the concentration of the sample before dilution. This will be the reported result. The result (before dilution factor is applied) should be greater than 0.0100 μ U/mL.
 - If the operator does not enter the dilution factor, the reported result will be that of the diluted sample. This result (before dilution factor is applied) should be greater than 0.0100 μ U/mL.
- For detailed information on ordering dilutions, refer to the ARCHITECT System Operations Manual, Section 5.

Calibration

- To perform an ARCHITECT TSH calibration, test Calibrators 1 and 2 in duplicate. A single sample of all levels of TSH controls must be tested to evaluate the assay calibration. Ensure that assay control values are within the concentration ranges specified in the package insert. Calibrators should be priority loaded.
- Calibrator Range: 0.0000 - 100.0000 μ U/mL.
- Once an ARCHITECT TSH calibration is accepted and stored, all subsequent samples may be tested without further calibration unless:
 - A reagent kit with a new lot number is used
 - Controls are out of range
- For detailed information on how to perform an assay calibration, refer to the ARCHITECT System Operations Manual, Section 6.

QUALITY CONTROL PROCEDURES

The recommended control requirement for the ARCHITECT TSH assay is a single sample of all control levels tested once every 24 hours each day of use. If the quality control procedures in your laboratory require more frequent use of controls to verify test results, follow your laboratory-specific procedures. Ensure that assay control values are within the concentration ranges specified in the package insert.

Verification of Assay Claims

For protocols to verify package insert claims, refer to the ARCHITECT System Operations Manual, Appendix B. The ARCHITECT TSH assay belongs to method group 1. The lower limit of the dynamic range is defined as the functional sensitivity of the assay.

RESULTS

The ARCHITECT TSH assay utilizes a 4 Parameter Logistic Curve fit data reduction method (4PLC, Y weighted) to generate a calibration curve.

Alternate Result Units

- The default result unit for the ARCHITECT TSH assay is $\mu\text{U/mL}$. When the alternate result unit, mIU/L , is selected, the conversion factor used by the system is 1.
- Conversion Formula: $(\text{Concentration in } \mu\text{U/mL}) \times (1) = \text{mIU/L}$.

Flags

- Some results may contain information in the Flags field. For a description of the flags that may appear in this field, refer to the ARCHITECT System Operations Manual, Section 5.

LIMITATIONS OF THE PROCEDURE

- Specimens run on the ARCHITECT TSH assay MUST be processed according to the specimen test tube manufacturer's instruction. Insufficient processing including deviations from recommended clotting times, centrifugation times, centrifugation speed and sample preparation techniques may cause inaccurate results.
- For diagnostic purposes, results should be used in conjunction with other data; e.g., symptoms, results of other thyroid tests, clinical impressions, etc.
- If the TSH results are inconsistent with clinical evidence, additional testing is suggested to confirm the result.
- Suspected hyperthyroidism based on low or undetectable TSH levels should be confirmed with additional thyroid function testing along with other clinical information.
- Specimens from patients who have received preparations of mouse monoclonal antibodies for diagnosis or therapy may contain human anti-mouse antibodies (HAMA). Such specimens may show either falsely elevated or depressed values when tested with assay kits which employ mouse monoclonal antibodies.^{22,23} Additional information may be required for diagnosis.
- Heterophilic antibodies in human serum can react with reagent immunoglobulins, interfering with *in vitro* immunoassays.²⁴ Patients routinely exposed to animals or animal serum products can be prone to this interference and anomalous values may be observed. Additional information may be required for diagnosis.

EXPECTED VALUES

A normal range of 0.35 $\mu\text{U/mL}$ to 4.94 $\mu\text{U/mL}$ (99% confidence interval) was obtained by testing serum specimens from 549 individuals defined as normal by the AxSYM Ultrasensitive hTSH II and AxSYM Free T_4 assays. It is recommended that each laboratory establish its own normal range which may be unique to the population it serves depending upon geographical, patient, dietary, or environmental factors.

SPECIFIC PERFORMANCE CHARACTERISTICS

Precision

The ARCHITECT TSH assay is designed to have a precision of $\leq 10\%$ (total CV). A study based on guidance from Clinical and Laboratory Standards Institute (CLSI, formerly NCCLS) document EP5-A²⁵ was performed for the ARCHITECT TSH assay. Three buffer based panel members (1, 2 and 3) and three processed human serum based panel members (4, 5 and 6) were assayed, using two lots of reagents, in replicates of two at two separate times per day for 20 testing days. Data from this study are summarized in the following table.*

Panel Member	Reagent Lot	Instrument	n	Mean Conc. ($\mu\text{U/mL}$)	Within Run SD	Run %CV	Total SD	Total %CV
1	1	1	80	0.0907	0.00160	1.8	0.00210	2.3
1	1	2	80	0.0879	0.00121	1.4	0.00171	1.9
1	2	1	80	0.0876	0.00135	1.5	0.00225	2.6
1	2	2	80	0.0888	0.00440	5.0	0.00469	5.3
2	1	1	80	5.7062	0.08187	1.4	0.12184	2.1
2	1	2	80	5.4750	0.09116	1.7	0.12761	2.3
2	2	1	80	5.5153	0.08122	1.5	0.11008	2.0
2	2	2	80	5.5320	0.08176	1.5	0.12501	2.3
3	1	1	80	28.4388	0.44471	1.6	0.82863	2.9
3	1	2	80	27.0156	0.76916	2.8	1.03741	3.8
3	2	1	80	27.2486	0.58176	2.1	0.75194	2.8
3	2	2	80	28.0434	0.55278	2.0	0.92480	3.3
4	1	1	80	0.5217	0.00655	1.3	0.00894	1.7
4	1	2	80	0.5024	0.00751	1.5	0.01128	2.2
4	2	1	80	0.4998	0.00653	1.3	0.00973	1.9
4	2	2	80	0.5070	0.00562	1.1	0.01156	2.3
5	1	1	80	2.0057	0.02380	1.2	0.03367	1.7
5	1	2	80	1.9318	0.02679	1.4	0.03842	2.0
5	2	1	80	1.9060	0.03844	2.0	0.04405	2.3
5	2	2	80	1.9369	0.02747	1.4	0.03499	1.8
6	1	1	80	16.5485	0.28856	1.7	0.38175	2.3
6	1	2	80	15.8935	0.27310	1.7	0.41347	2.6
6	2	1	80	15.9947	0.25055	1.6	0.38375	2.4
6	2	2	80	16.3632	0.23302	1.4	0.41631	2.5

* Representative data; results in individual laboratories may vary from these data.

Recovery

The ARCHITECT TSH assay is designed to have a mean recovery of 100 +/- 10% when analyzing samples spiked with known amounts of TSH. TSH (spanning the dynamic range) was added to 10 aliquots of human serum. The concentration of TSH was determined using the ARCHITECT TSH assay and the resulting percent recovery was calculated.* The percent recovery of the ARCHITECT TSH assay ranged from 91.8% to 104.3% with an average of 99.4%.

* Representative data; results in individual laboratories may vary from these data.

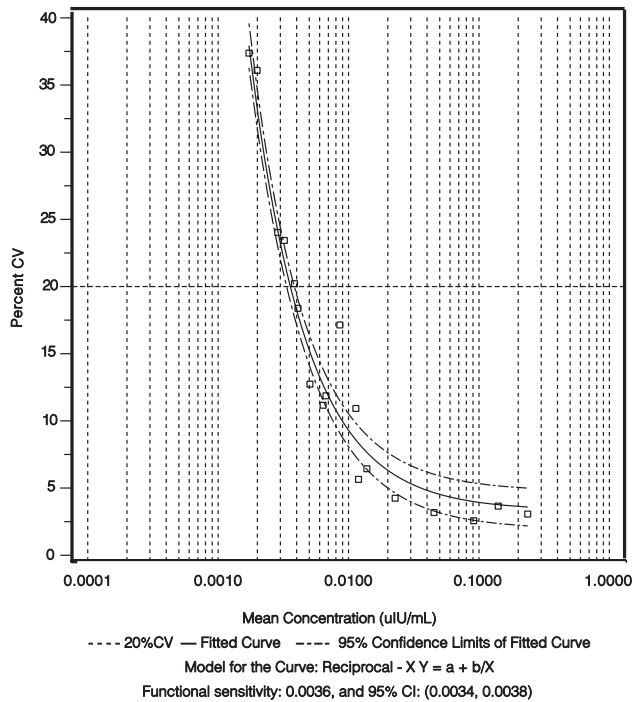
Sensitivity

Functional

Functional sensitivity is defined as the concentration of TSH that can be measured with an interassay CV of 20%.⁶ The ARCHITECT TSH assay is designed to have a functional sensitivity of $\leq 0.01 \mu\text{U/mL}$, which meets the requirements of a third generation TSH assay.

In a representative study, the functional sensitivity was calculated to be $\leq 0.0038 \mu\text{U/mL}$ (upper 95% confidence limit of 0.0042 $\mu\text{U/mL}$). In addition, a total %CV was calculated from the pooled data generated using two lots of reagents and two instruments. The data exhibited a functional sensitivity of $\leq 0.0036 \mu\text{U/mL}$ (upper 95% confidence limit of 0.0038 $\mu\text{U/mL}$). This was determined by testing human serum and processed human serum samples ranging from 0.0007 $\mu\text{U/mL}$ to 0.2365 $\mu\text{U/mL}$. Each sample was tested over 35 to 42 days on each of two ARCHITECT *i* Systems using two reagent lots with at least 10 replicates per lot per instrument. The total and interassay %CVs were calculated and plotted against the mean concentration. A reciprocal curve was fitted through the data and the functional sensitivity was estimated as the concentration corresponding to the 20% CV on the fitted curve.

ARCHITECT TSH
Functional Sensitivity by Precision Method
Both Instruments and Both Lots



Analytical

The ARCHITECT TSH assay is designed to have an analytical sensitivity of $\leq 0.0025 \mu\text{IU/mL}$.

Analytical sensitivity is defined as the concentration calculated as the mean plus two standard deviations of replicates of the ARCHITECT TSH MasterCheck Level 0 (0.0 $\mu\text{IU/mL}$). The analytical sensitivity (low-linearity) is defined in the ARCHITECT TSH assay parameters as 0.0025 $\mu\text{IU/mL}$.

Analytical Specificity

The ARCHITECT TSH assay is designed to have an analytical specificity of $< 10\%$ cross reactivity with the following substances, at the concentration levels listed, in human serum samples containing TSH in the normal range.

- FSH $\leq 500 \text{ mIU/mL}$
- LH $\leq 500 \text{ mIU/mL}$
- hCG $\leq 200,000 \text{ mIU/mL}$

Interference

The ARCHITECT TSH assay is designed to have a potential interference from hemoglobin, bilirubin, triglycerides and protein of $\leq 10\%$ at the levels indicated below.

- Hemoglobin $\leq 500 \text{ mg/dL}$
- Bilirubin $\leq 20 \text{ mg/dL}$
- Triglycerides $\leq 3000 \text{ mg/dL}$
- Protein $\leq 2 \text{ g/dL}$ and 12 g/dL

Accuracy by Correlation

The ARCHITECT TSH assay is designed to have a slope of 1.0 ± 0.2 and a correlation coefficient (r) of ≥ 0.95 when compared to the AxSYM Ultrasensitive hTSH II assay.

A study was performed where specimens were tested using the ARCHITECT TSH assay and AxSYM Ultrasensitive hTSH II assay. Data from this study were analyzed using least squares and Passing-Bablok²⁶ regression methods and are summarized in the following table.*

Abbott ARCHITECT TSH vs. Abbott AxSYM Ultrasensitive hTSH II				
Method	Number of Specimens	Intercept	Slope	Correlation Coefficient
Least Squares				
Linear Regression	534	-0.7135	0.96	0.987
Passing-Bablok				
Linear Regression**	534	0.0098	0.91	0.987

In this evaluation, serum specimens tested ranged from 0.0109 $\mu\text{IU/mL}$ to 127.9816 $\mu\text{IU/mL}$ with the ARCHITECT TSH assay.

* Representative data; variables such as differences in sampling size and sample population may impact the correlation of the assay; therefore, results in individual laboratories may vary from these data.

** A linear regression method with no special assumptions regarding the distribution of the samples and the measurement errors.²⁶

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Abbott Ireland
Diagnostics Division
Lisnamuck, Longford
Co. Longford
Ireland
+353-43-3331000



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Abbott Park, IL 60064 USA
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ABBOTT 65205 Wiesbaden, Germany

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