



QuantiFERON-TB GOLD COLLECTION AND PROCESSING

 FAIRVIEW



Lesson Details

Target Audience

This lesson is intended for all Fairview Employees who collect, handle, and process QTB specimens after the collection.

Author and Qualifications

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Sources

Fairview Diagnostic Laboratories Lab Guide: QuantiFERON-TB Gold (QTB)

www.cellestis.com

Cellestis QuantiFERON-TB Gold Package Insert

Fairview Health Services- PATIENT IDENTIFICATION AND LABORATORY SPECIMEN LABELING - procedure # S:LM-L016

Contact Hours

0.5

Estimated Duration and Viewing Instructions

The expected time to complete this learning activity is 15 minutes and should be completed during your regularly scheduled work time. Any lessons or classes completed outside your scheduled work time must have prior approval from your supervisor and a supervisor or manager must approve any overtime.



Objectives

Upon completion of this lesson, learners should be able to:

- Know the proper QTB collection procedure.
- Describe the purpose for proper QTB handling from after collection to delivery to the testing laboratory.
- Become familiar with the key factors in preanalytic processing to assure accurate results.
- Perform the proper steps from the receipt of the tube set from the collection site, storage, incubation of the tube set, and transport to the testing laboratory.



How is This Lesson Relevant?

There are multiple steps involved with the QuantiFERION-TB Gold method that must be completed properly by Clinical Laboratory Staff to ensure accurate performance.

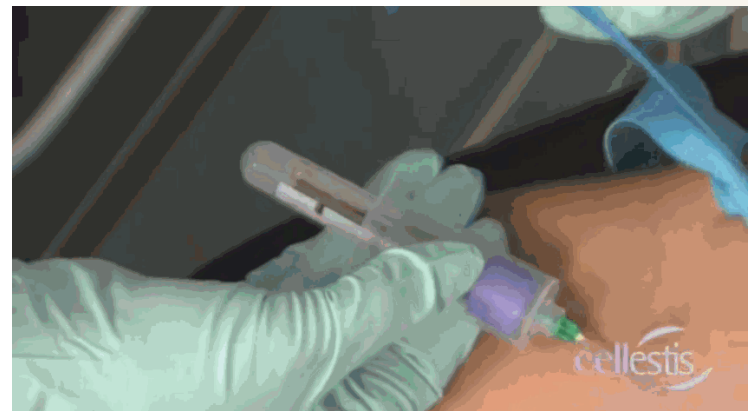
**Accurate results require
accurate pre-analytic collection
and processing!**



Collection and Transport

❖ QTB sets are collected at the various clinics, outreach clients, and as inpatients.

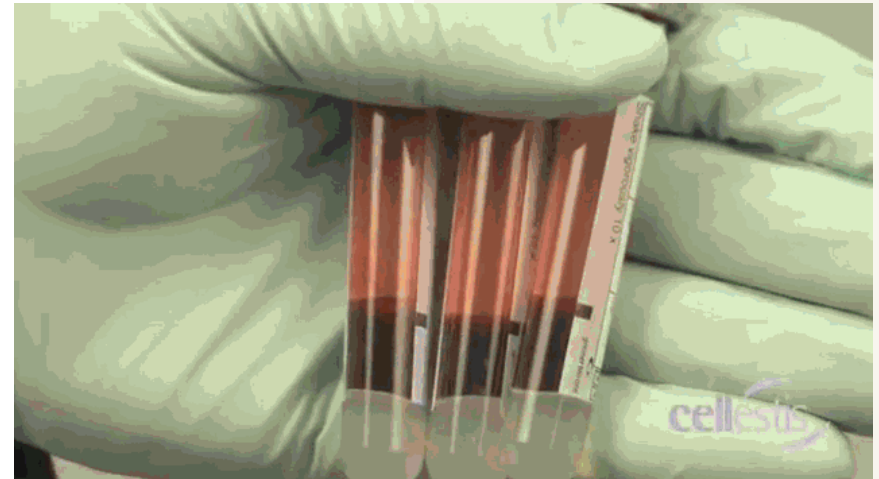
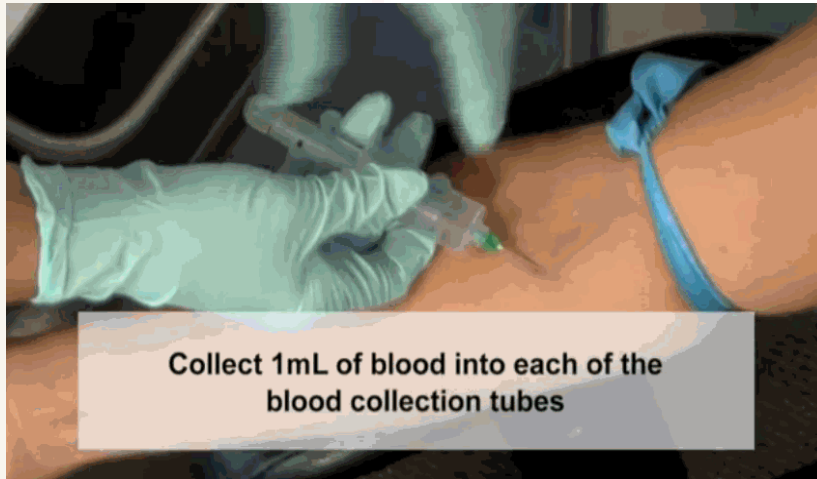
❖ Accurate QuantiFERON-TB Gold results require accurate collection, incubation, processing, storage, transport, and testing.





Collection and Transport

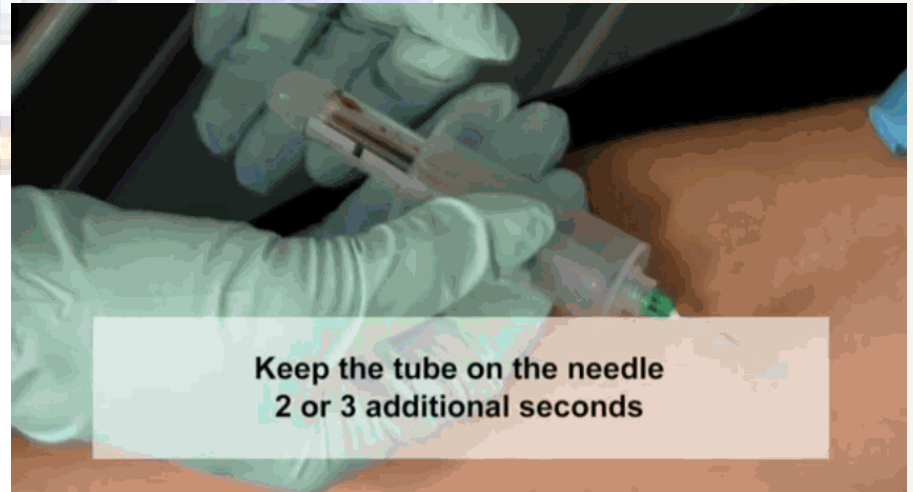
- ❖ Tubes need to be at 17-27°C (63-81°F) at the time of collection
- ❖ It is extremely important to draw exactly 1mL of blood into each of the 3 tubes. There's a black mark on the side of each tube that indicates the 1mL fill line.





Collection and Transport

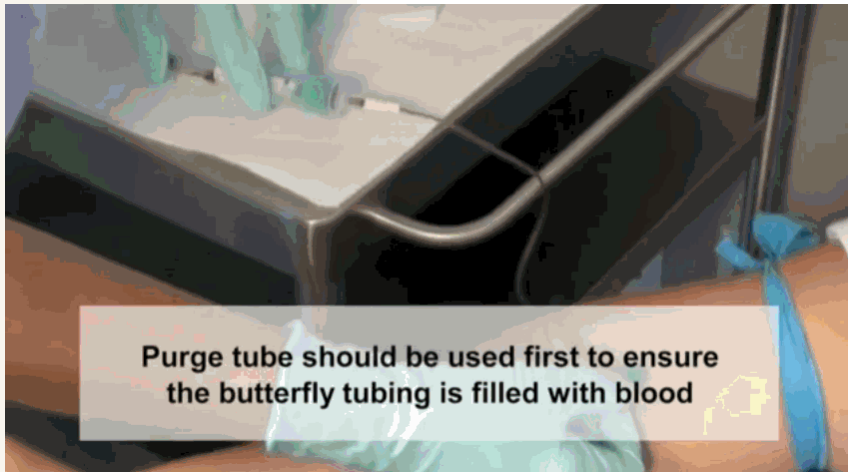
❖ *Tubes will fill slowly.*



❖ Keep each tube on the needle for **2-3** seconds after tube appears to have completed filling.



Collection and Transport

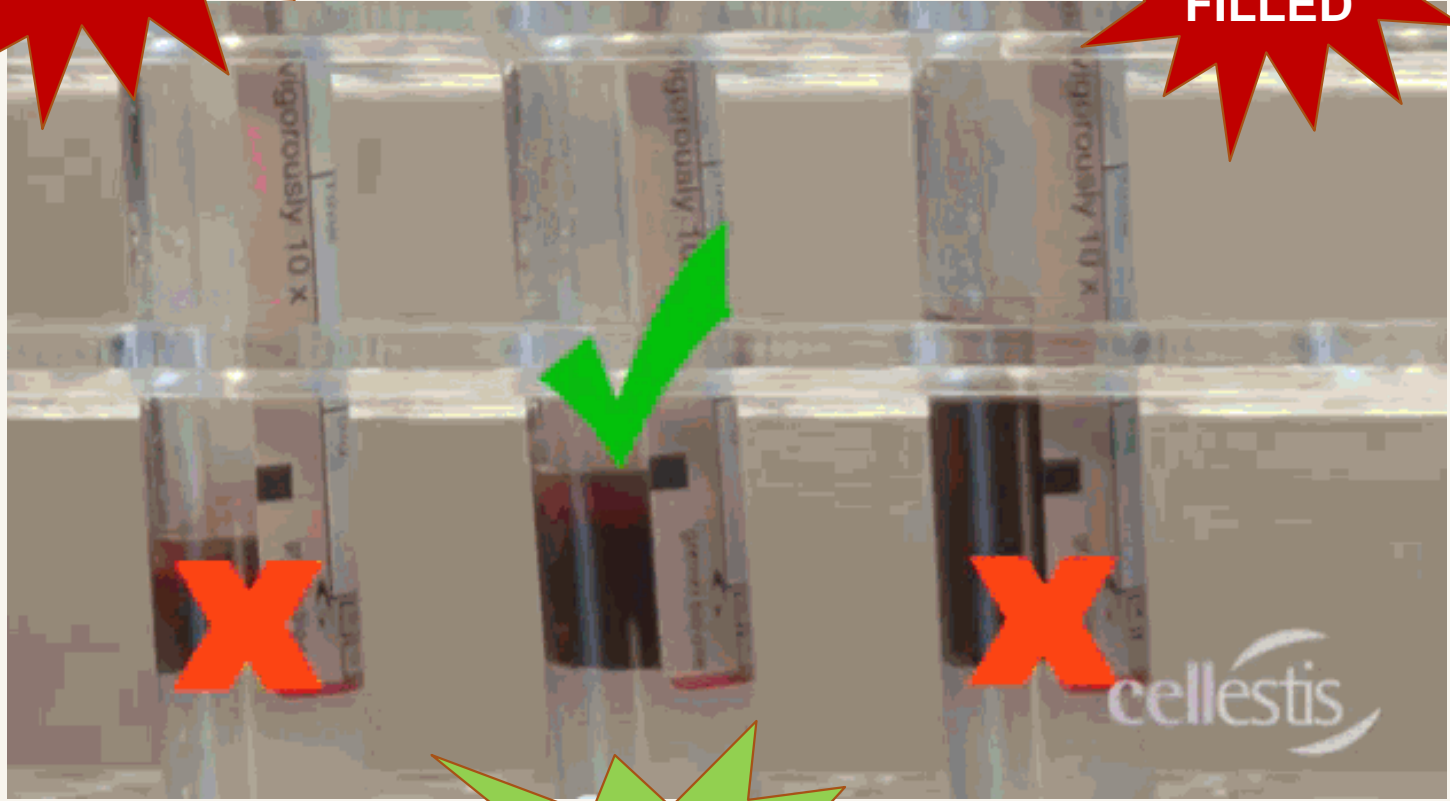


- ❖ Use of a syringe may ensure correct blood volume.
- ❖ If butterfly needle is used, first collect other required tubes or use a “lead discard” tube to remove the air. Then proceed with collecting the QTB tubes



UNDER-FILLED

OVER FILLED



GOOD TO GO!



Collection and Transport

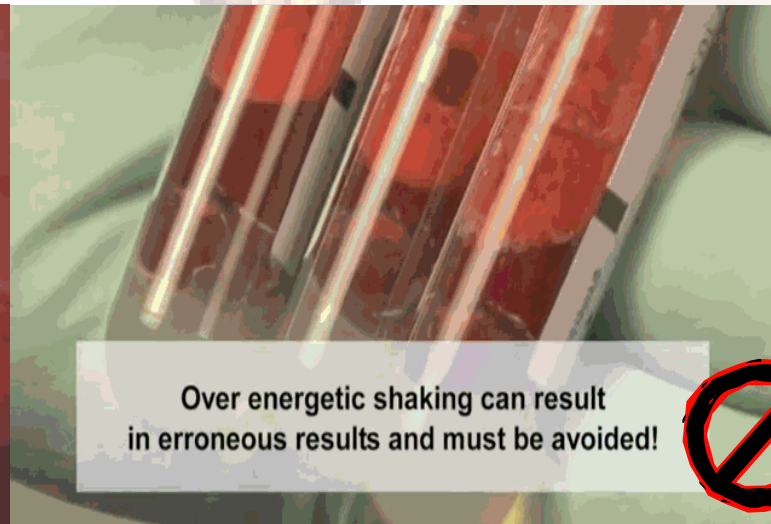
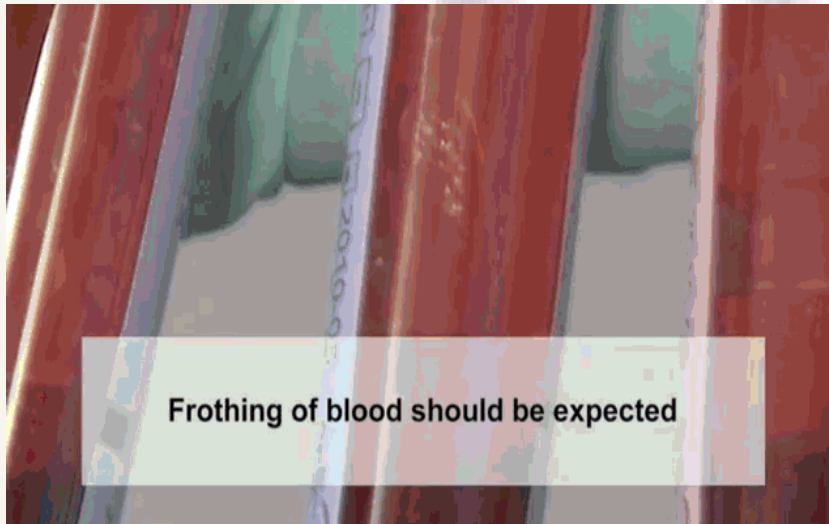
- ❖ Thorough mixing is required to ensure complete integration of the tube's contents into the blood.
- ❖ Immediately SHAKE the tubes firmly 10 times (5 seconds).
- ❖ Entire inner surface of tube must be coated with blood.



Collection and Transport

❖ Over energetic shaking may cause gel disruption and could lead to aberrant results.

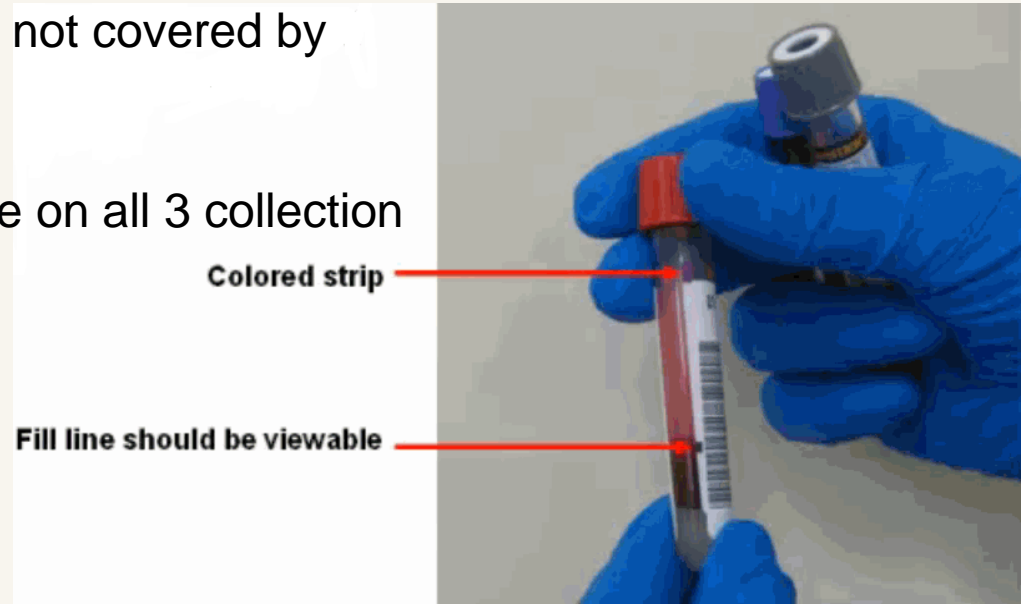
❖ **Frothy samples are acceptable but foamy samples are NOT.**





Collection and Transport

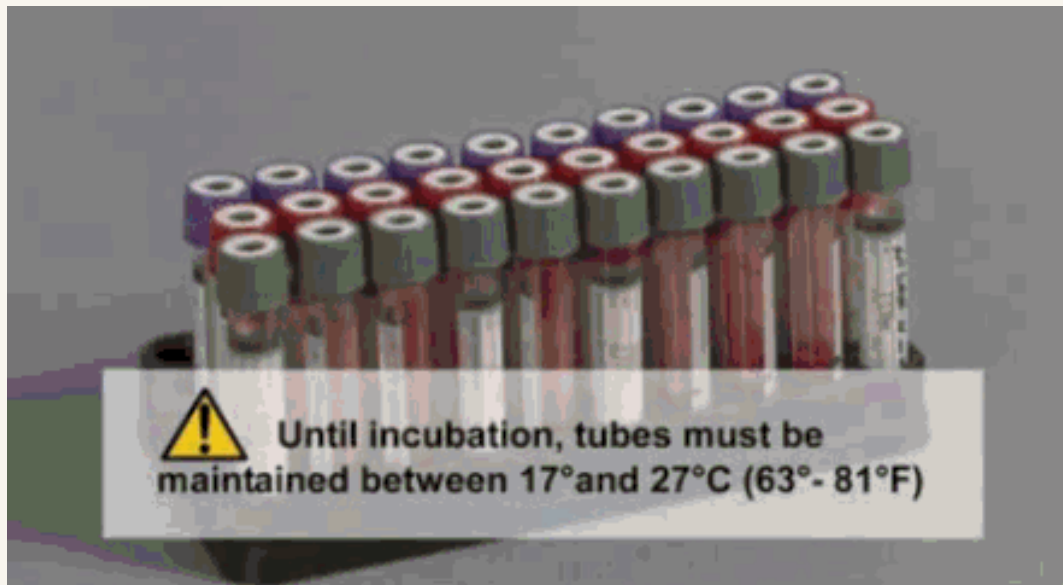
- ❖ LABEL tubes appropriately. CID labels should be placed on each of the 3 tubes in the tube set so that the colored QuantiFERON strip at the top of the tube, and the black fill line are not covered by the label.
- ❖ The back window should be visible on all 3 collection tubes.
- ❖ If possible, reprint a second set of CID labels to make sure all 3 tubes have the same long CID label on them
- ❖ The tubes should be labeled according to the Fairview Health Services PATIENT IDENTIFICATION AND LABORATORY SPECIMEN LABELING procedure # S:LM-L016.





Collection and Transport

- Tubes are to remain at room temperature until incubation. Specimens should not be sent refrigerated or frozen.
- Tube sets will generally arrive as incubated or non-incubated and it is important to identify how they are received and how to handle appropriately.





Unincubated Samples

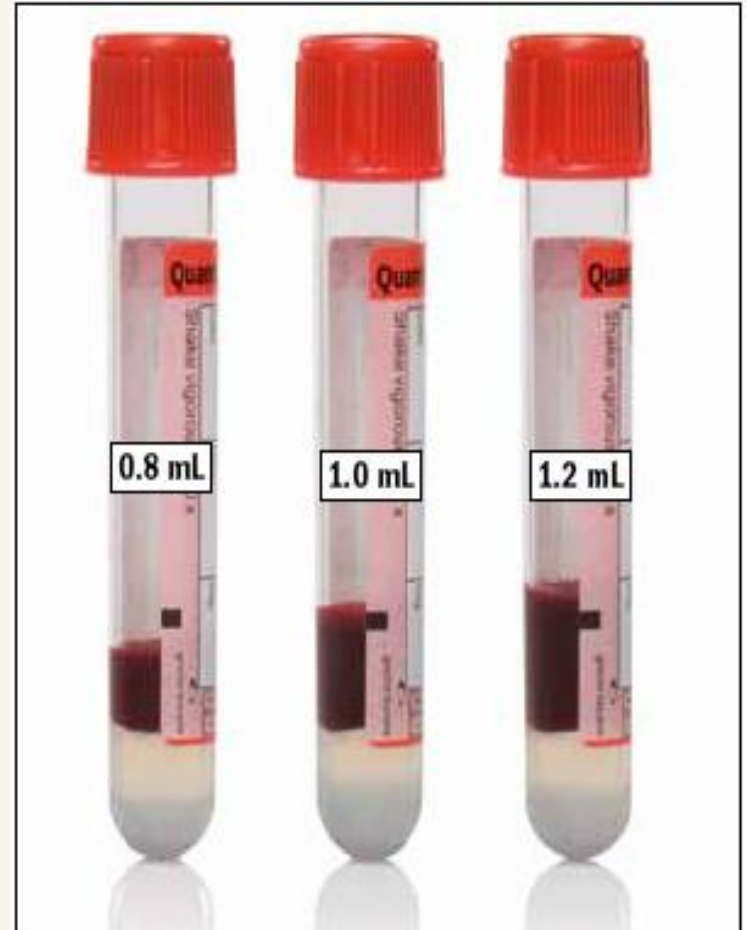
- It is recommended that incubation start as soon as possible and must be within 16 hours of collection.



- ❖ Once a QTB set arrives, verify the collection time was within 16 hours.
- ❖ If incubation hasn't started before the 16 hour time limit has elapsed, the test should be canceled by the receiving laboratory, test credited, and the sending location must be contacted with an explanation.
- ❖ Educational materials should be provided if necessary to correct in the future.



- The 3 QTB tubes in the tube set are manufactured to draw 1 mL of blood and perform optimally within the range of 0.8 – 1.2 mL. Under or over-filled tubes outside of the 0.8-1.2 mL range may lead to erroneous results.
- Upon receiving the tube set, Verify each tube for proper fill levels.
- If the level of blood is not close to the BLACK INDICATOR LINE, The test should be canceled immediately by the receiving lab, test credited and the sending location must be contacted with an explanation.
- If necessary, educational materials should be provided.





Incubation



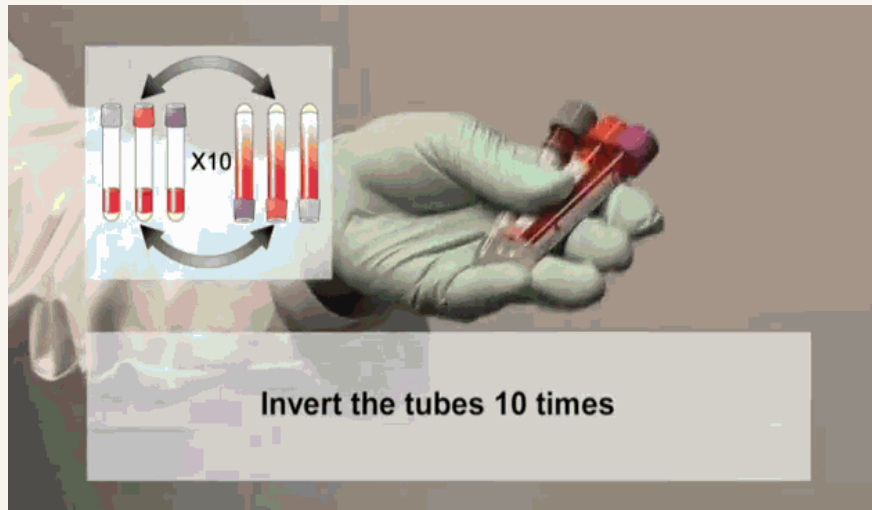
**Improper incubation
will cause
erroneous results.**

- **Ensuring that the tubes are incubated at the correct temperature and for the correct amount of time is essential to the accurate performance of the test.**
 - The tube set should not be refrigerated or frozen prior to incubation.
 - Humidity and CO₂ are not required for incubation.



Incubation

If incubation is at all delayed from the time of collection, re-mix tubes by inverting 10 times before incubation.

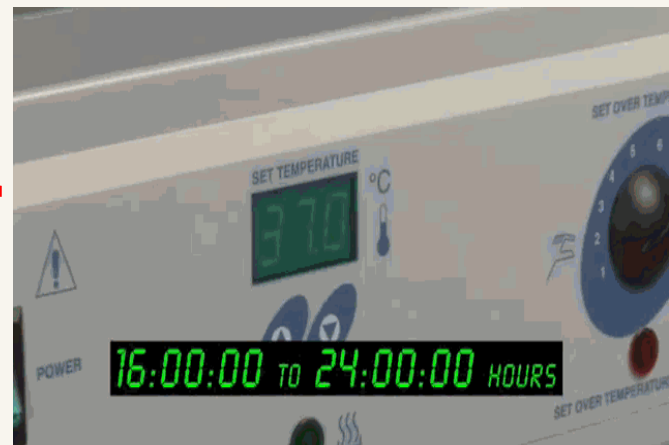


Over energetic shaking may cause gel disruption and could lead to aberrant results.



Incubation

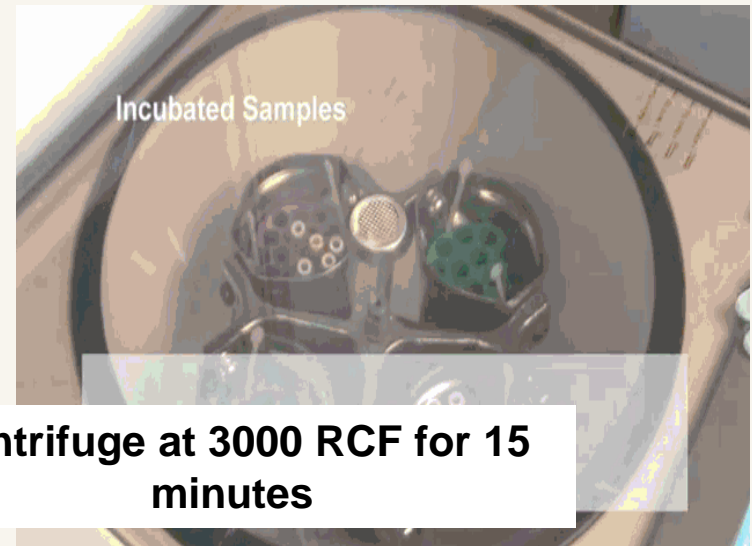
- QTB specimens should not be delayed for incubation once they are received by Specimen Management or the Acute Care Labs.
- Immediately place the blood tubes within the correctly labeled rack in the incubator.
- Document on the log: the time the specimens were placed into the incubator and the time frame they are to come out. Follow the guidelines on the side of the log for the times.
- INCUBATE all 3 tubes upright at $37^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for 16-24 hours.
- **The tubes can not be taken out of the incubator and then re-incubated.**





Centrifugation

- After incubation, centrifuge tubes in a swing bucket centrifuge for 15 minutes at 3000 RCF (g).

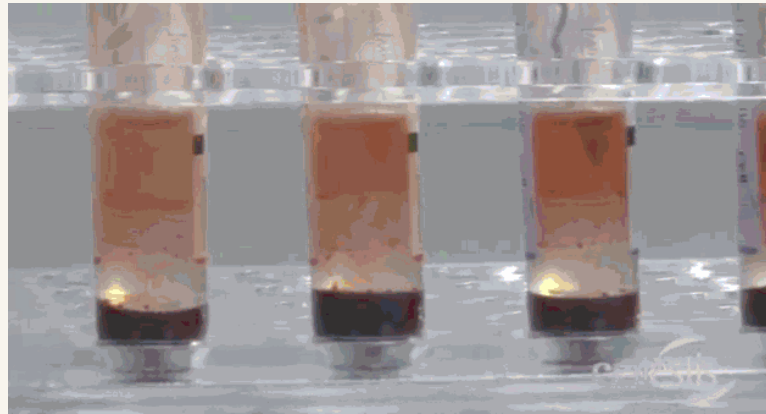


- Place all 3 tubes together back in the original QTB transport bag, track through Sunquest, apply Batch label to bag, and label “incubated”.



Centrifugation

- After centrifuging the samples, the gel plug will separate the cells from the plasma. If this does not occur, the tubes should be re-centrifuged at a higher speed.



- After centrifugation, the plasma must be stored in original collection tube at 2°C to 8°C for up to 28 days (8 weeks).
 - *Specimens should not be frozen.*



Incubated Samples

- Incubated samples that arrive also need to be verified to correct fill volumes.
- Centrifuged samples need to be verified that they have been stored for less than 28 days at 2°C to 8°C.
- Incubated samples that have not been centrifuged need to be verified that they have been received within 3 days of incubation and maintained at a temperature of 4°C and 27°C.





Delivery to Special Chemistry

Deliver Incubated and Centrifuged Samples to Special Chemistry:

❖ Special Chemistry is open: (M-F 7:00 -16:00)

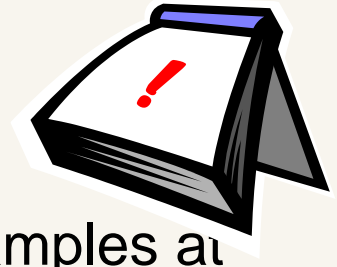
- ACL-East will PTS the processed and batched samples to Special Chemistry.
- Specimen Management will place the processed and batched samples in routing bucket for pickup.

❖ Special Chemistry is closed:

- ACL will store the processed and batched samples at 2°C to 8°C for morning delivery.
- Specimen Management will store the processed and batched samples in routing bucket at 2°C to 8°C for morning pickup.



Holidays and Weekends



❖ **Special Chemistry is closed:**

- ACL East will process, batch, and store the samples at 2°C to 8°C for delivery on Special Chemistry's next working day.
- Specimen Management will need to note the received time of QTB tube set and department hours of operation to adjust the start of incubation and processing times in order to maintain the proper incubation time of 16-24 hours at 37°C ± 1°C .
- Specimen management will then process, batch and store the samples in routing bucket at 2°C to 8°C for delivery on Special Chemistry's next working day.



Sample Rejection

- Learn the QTB Sample Rejection Criteria and the 2-step process for canceling and crediting a test.
- It is everyone's job to cancel a QTB when it does not pass the criteria. Be a team player and cancel and credit the test at the receiving laboratory.
- Those main QTB Sample Rejection Criteria are:
 - Mislabeled or unlabeled specimens
 - Insufficient volume or tubes overfilled
 - Samples over shaken
 - Samples transported at wrong temperatures
 - Samples > 16 hours old prior to incubation
 - **Specimens other than those collected and processed according to laboratory procedure and instructions in the QuantiFERON-TB Gold collection kit.**





ETC Cancellation Codes

Common ETC codes to use when
cancelling QTB tests.

- **LABPRO** - (Lab accident –specimen processed incorrectly)
- **USFULL** - (Tube overfilled)
- **USUNDR** - (Tube under filled)
- **USSTO** - (Unsatisfactory specimen – too old for testing)
- **CANL** - (Canceled – Specimen improperly labeled)



FAQ

- **Can the blood collection tubes be transported lying down?**
Yes. QuantiFERON-TB Gold Blood Collection Tubes can be transported lying down only after the tube mixing step has been done. The tubes should be re-mixed by inverting 10 times immediately prior to being placed upright in the 37°C incubator.
- **What if 37°C incubation starts more than 16 hours after the time of blood collection?**
The Package Insert specifies that the 37°C blood incubation must commence within 16 hours of collection. Delay in incubation may cause false negative or indeterminate results. The sample must then be cancelled and recollected.
- **Can I incubate the blood collection tubes lying down?**
QuantiFERON-TB Gold Blood Collection Tubes must be kept upright during incubation at 37°C.
- **The gel plug hasn't moved during centrifugation. What should I do?**
After incubation of tubes at 37°C, the plasma is separated from the cells by centrifuging for 15 minutes 3000 RCF (g). The gel plug should move to separate the cells from the plasma. If this does not occur, the tubes should be re-centrifuged at a higher speed.



Conclusion

- **Once again, it must be emphasized that accurate QuantiFERON-TB Gold results require accurate collection, incubation, processing, storage, transport, and testing.**
- Questions – Contact:
 - 📞 Acute Care, East 612-273-3336
 - 📞 Acute Care, West 612-273-6135
 - 📞 Special Chemistry 612-273-4047
 - 📞 Specimen Management 612-273-3714



Competency

- After completion of this educational portion, please complete the competency test.
- All employees must obtain 80% to mark the test as completed.
- If the first attempt at taking the test does not result in a score of 80%, please review the material and retake the test.

