



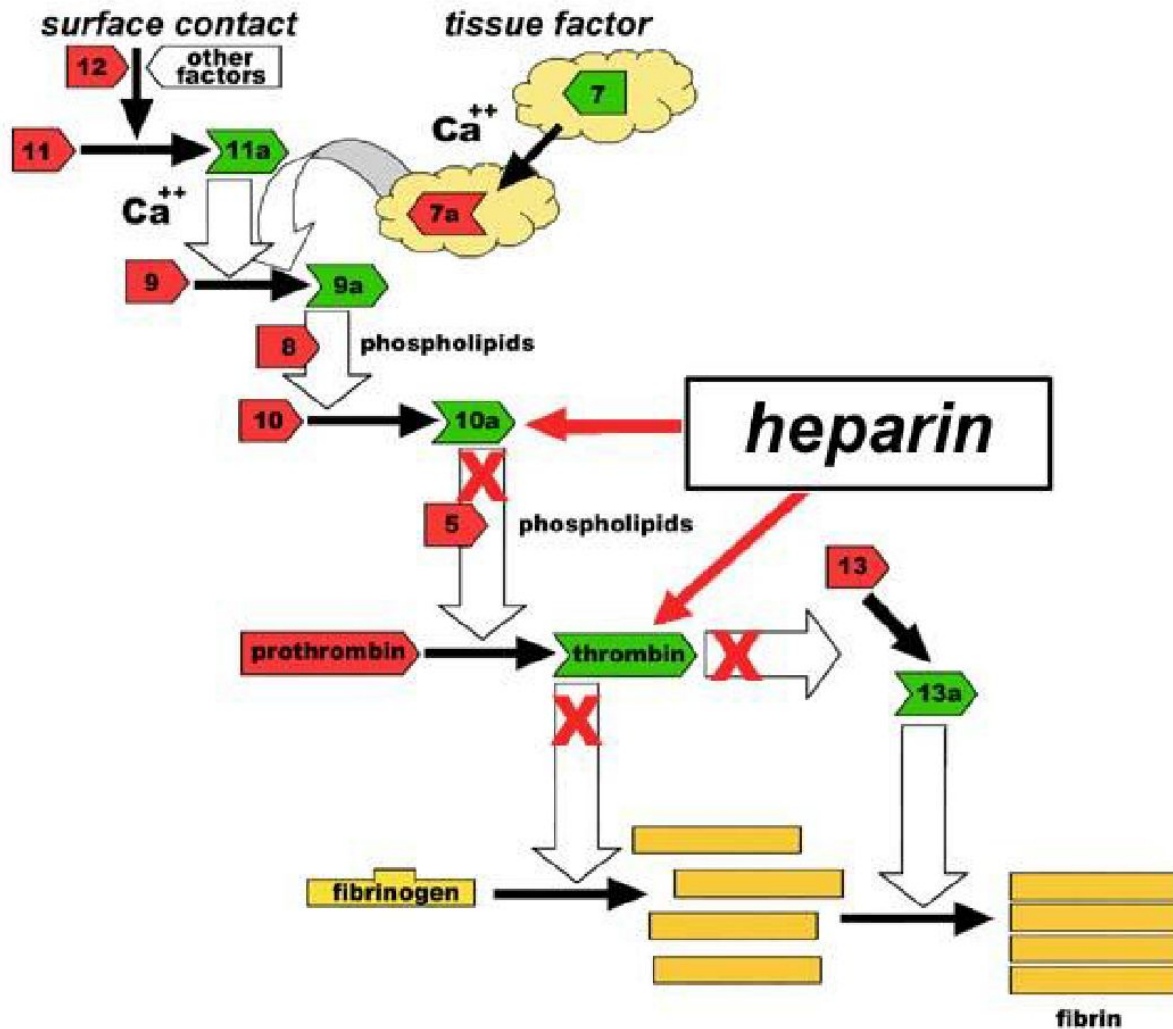
# iSTAT ACT

Stanford Point-of-Care  
Testing  
Training Module for Nurses &  
Physicians

# What is ACT?

- **Activated Clotting Time (ACT) is a whole blood coagulation test similar to the activated partial thromboplastin time (PTT) test using plasma.**
- **Clay particles (kaolin) activate the intrinsic clotting pathway leading to activated thrombin, which acts on a synthetic thrombin substrate forming an electrochemically active product.**
- **Like PTT, ACT is especially sensitive to**

# Heparin Therapy



By interacting with antithrombin, Heparin primarily inhibits thrombin and activated Factor X.

# When do we use ACT?

- ACT helps to determine if the patient is adequately heparinized during cardiopulmonary bypass surgery (to prevent activation of coagulation during exposure to the extracorporeal circuit).
- ACT is helpful when large doses of unfractionated heparin are used (with concentrations between 1- 6 units/ml).
- It is not as helpful during vascular surgery employing lower doses (concentrations between 0.2 - 1 units/ml) or when using low molecular-weight heparin.

# What do I need to run ACT?

- **iSTAT analyzer (with battery)**
  - The analyzer must be ready to use. If it displays the message, “Electronic Simulator Fail” or “Simulator Run Required”, review the iSTAT ACT procedure for instructions.
- **iSTAT ACT cartridges**
  - These need to stay sealed until ready to use. They should not be expired (check expiration date) and should be at room temperature (make sure to remove individual cartridges from refrigerator at least 5 minutes before using).

# iSTAT analyzer & battery

Press “On” button and make sure that battery is charged.

If the battery is dead, exchange it with one in the docking station (which will recharge it). **DO NOT DISCARD** dead batteries.



# iSTAT ACT cartridge

After allowing cartridge to reach room temperature, remove from pouch and set it down on a flat stable surface.

Handle cartridge by the sides only. Do not touch electrodes or squeeze center.

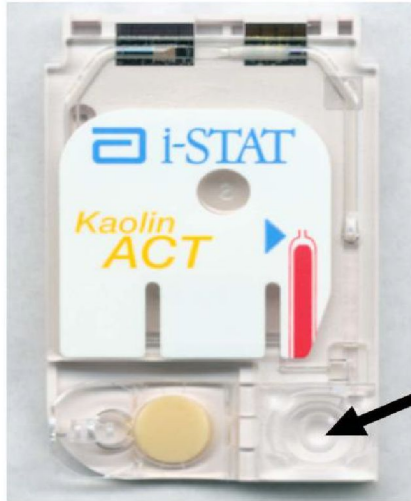


# What is the specimen for ACT?

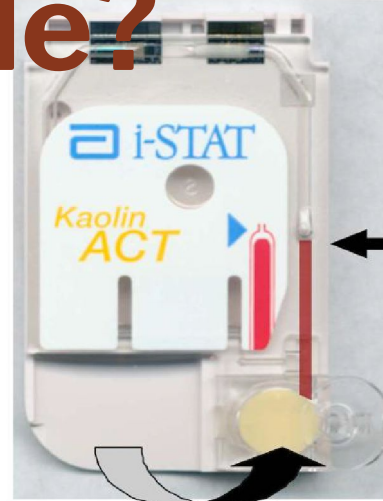
- Flush the extracorporeal line, discarding 5 ml of blood and then collect 0.5 ml of fresh whole blood using a clean plastic syringe (no anticoagulant).
- Mix specimen gently without creating any micro-bubbles.
- Dispel any air from the tip of the syringe.
- Discard the first drop of blood onto a gauze pad.
- Immediately dispense sample into cartridge.



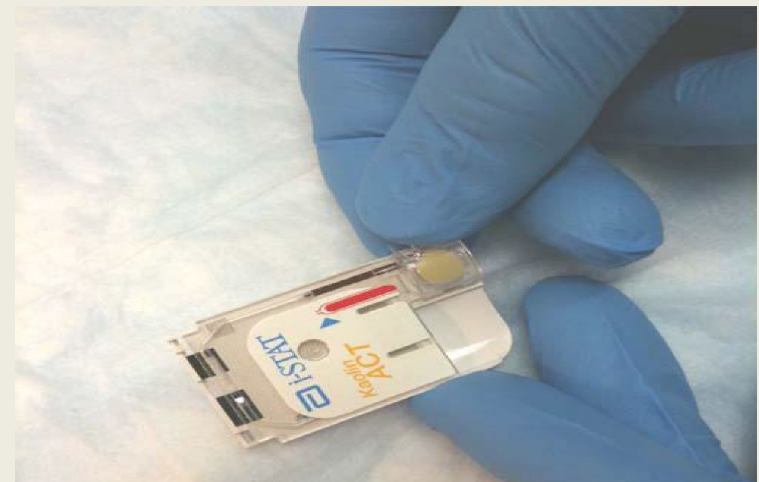
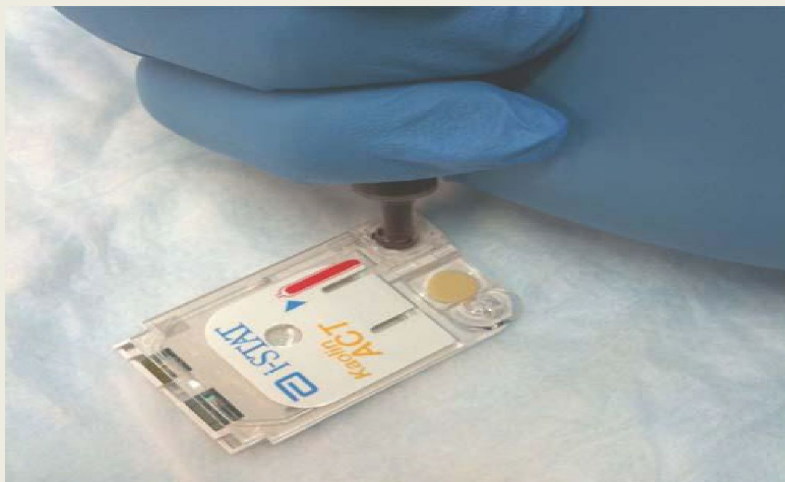
# How do I add the ACT sample?



Place tip of syringe (no needle) here and slowly fill.



When blood reaches here stop and snap cover.



# How do I initiate ACT testing?

Insert cartridge into iSTAT analyzer and gently push until it clicks in place.



# How do I complete ACT testing?

- Scan your operator ID using the barcode you received during training.
- Scan the patient's CSN using the patient's armband. If this is not feasible, manually enter (will need to be done in duplicate).
- The iSTAT analyzer will automatically perform electronic quality control & complete the testing.
- Do not remove the cartridge (or move the analyzer) until testing is complete.

# How do I interpret ACT results?

- We validated iSTAT ACT test vs. the Hemochron Jr. device previously used in the Stanford Operating Room.
- The reference range (baseline) of 70-140 seconds was comparable.
- Heparinized patients, however, showed a bias with iSTAT ACT results, on average, 60 seconds longer than Hemochron Jr. results
- iSTAT ACT results >200 seconds correlate with heparin levels >1 U/ml; > 400 seconds with levels >2 U/ml and >600 seconds with levels >3 U/ml.

# How do I record ACT results?

- If a result is flagged with “<” or “>”, the result may be outside the cartridge’s measuring range. If a result is flagged with “\*\*\*”, the cartridge sensor may have been compromised. In either case, repeat test with new cartridge.
- At the end of the procedure, insert the iSTAT analyzer into the docking station. It will automatically upload results to EPIC.

# What else is important about ACT?

- The target range for heparinization during cardio-pulmonary bypass surgery is generally cited as **480 seconds**.
- No point-of-care ACT test has been shown to correlate precisely with heparin levels and **significant variability** may exist between one patient and another based on platelet count and function, patient's temperature, degree of hemodilution, and other factors.



# iSTAT ACT

For more information, review the  
iSTAT ACT procedure or contact  
the Stanford POCT section at  
**extension 650-724-8934**