

Blanchard Valley Health System

Blanchard Valley Hospital

Laboratory Services

1900 South Main Street, Findlay, OH 45840

Laboratory Outreach Centrifuges (LTR27054)

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Attention: Printed copies MAY not be the most current information. Please consult the Lab QMS for the current version.

Laboratory Outreach Centrifuge Procedure

Principle:

The pre-analytic phase of laboratory testing consists of: specimen collection, processing, handling, transportation, and physiological issues which all have an important impact on the integrity of laboratory test results. In order to maintain the highest specimen integrity, a centrifuge may be made available for use prior to specimen pick up or drop off for testing at Blanchard Valley Hospital Laboratory Services. General purpose centrifuges place a centrifugal force upon fluids to separate out cellular and/or other components. The centrifugal forces increase with increasing speed and with the radial arm length. General purpose centrifuges are designed to obtain higher centrifugal forces by increasing the speed rather than increasing the radius, which is usually fixed. Components of a general purpose centrifuge include the chamber, a cover, centrifuge head, the shaft and the rotor, and the motor/drive assembly. The chamber encloses the head and the centrifuge tubes. The motor and drive assembly impart the force to the shaft and rotor to create the desired centrifugal force. A braking device is often provided for occasionally desired rapid deceleration. A control panel usually includes a power switch, circuit breaker, speed control, and timer.

Policy:

In order to facilitate the expanding BVH Laboratory Outreach Services while maintaining quality results, specimen centrifuge(s) may be placed in strategic locations to best meet the necessity of maintaining specimen integrity at all times. Centrifuge manufactures and models may vary from location to location according to factors that could include: strategic location, workload, and availability of like models, costs, and ease of use for our customers and/or associates.

Precautions:

- Do not operate centrifuges unless the covers are closed. Keep hair, beard, neckties, hair ribbons, hair braids, or other dangling items out of the way.
- Do not centrifuged uncapped or uncovered tubes containing specimens or flammable liquids.
- Before centrifuging check the integrity of the tubes and tube holders.
- When the centrifuge is in operation, the lid must always be closed. If a noise or vibration begins, stop the centrifuge immediately and check for improper balancing of loads, caps, and rotors.

- Centrifuges should be clean and free of spills. The holders (cups) and centrifuge should be cleaned as needed.
- Never force a tube into the tube holder. The tube holders and cushions are designed to accommodate most common sizes of tubes.
- Use only high quality test tubes (provided by Blanchard Valley Hospital Laboratory Services). Lower quality or inexpensive glass or plastic tubes may fracture and release their contents into the tube holder.

Specimen:

- **Type:** Specimen type and tube size may vary according to the specimen requirements for the ordered laboratory analyte(s). Specimen requirements are located in the Blanchard Valley Hospital Laboratory Collection Manual.
- **Handling Conditions:** Gel separator tubes should be centrifuged within 2 hours after collection.

Equipment and Materials:

- **Equipment:** Centrifuge manufactures and models may vary from location to location according to factors that could include: strategic location, size needed, and availability of like models, costs, and ease of use for our customers to use and maintain compliance.
- **Materials:**
 - Patient Specimens
 - Balance tubes
 - Tube Holders: a couple of different sizes may be available depending on centrifuge manufacturer.
 - Specimen tube rack
- **Preparation:** Adjust balance tube volumes to be equal weight of those tubes across from each other on the rotor.
- **Storage Requirements:** Centrifuges must be stored on a flat, sturdy, level surface at room temperature, within close proximity to an appropriate power outlet in a secluded or secure location within each outreach facility.
- **Equipment Maintenance, Verification, and Calibration:** Please refer to BVH Laboratory Centrifuge Maintenance policy.
 - BVH Laboratory Outreach Centrifuge maintenance is performed by, Blanchard Valley Health System owned, Technicore Biomedical Engineering. Technicore retains all records of maintenance checks, inspections, and instrument maintenance history logs for our Outreach centrifuges such that it meets all manufactures and laboratory accrediting agency's guidelines. Blanchard Valley Hospital Laboratory shall notify Technicore of any location changes made to any Outreach specimen centrifuge.
 - For Trouble Shooting, Maintenance, or Repairs please call the Blanchard Valley Hospital Laboratory for technical assistance at 419-423-5318.
 - Please refer to and follow the Lab QMS for Equipment downtime policy.
- **Performance Parameters:** Centrifuges used for sample preparation for specimens to be tested for laboratory analysis should be set up to achieve an RCF (Relative Centrifugal Force) according to the test tube manufacture's recommendations. The recommendation for centrifugation of BD Vacutainer tubes specifies an RCF (RCF/g) of 1000-1300xg with a spin time of 10 minutes in a swing-bucket centrifuge.

Operation

1. **Always Balance the Load!** Be certain to balance tubes of equal weight across from each other on the rotor. You can only balance 2, 3, 4, or 6 tubes at a time on a 6-place rotor. If you need to spin only one tube, you must use another tube filled with fluid to balance the rotor. Proper balancing will improve sample separation and will extend the life of the centrifuge. Spinning out-of-balance loads may break tubes, and can cause damage to the unit.
2. **Always make sure tubes are supported from the bottom!** Never allow a test tube to hang by its cap on the rim of the tube holder. When the unit reaches high speed, the stopper top will pop off and the tube will break as it hits the bottom of the tube holder. The cap may also cause damage inside the bowl.
3. **Never force a tube into the tube holders.** Tubes should fit easily into and out of the tube holders. Make sure the tubes do not exceed the length limits for the tube holder, or the tubes may hit the top of the lid and break upon start-up.
4. Turn the timer on to **10 minutes**, close the lid and the centrifuge will start automatically, depending on the make and model of the centrifuge. The unit should come up to speed with a smooth sound and little or no vibration. If there is excessive vibration or noise, shut off the unit immediately and adjust the load to ensure it is balanced.
 - a. **NOTE:** The CxR model unit can only be started within 6 seconds after the lid is closed. After 6 seconds of inactivity, the unit will become idle, after which you must re-open, inspect the load, and re-close the lid to activate.
 - b. **NOTE:** The speed is normally set at **3000 RPM (30 x 100)**. The RCF is calculated based on the speed and radius of the tube in the rotor. RPM is the number of revolutions per minute. In other words, RPM's is speed (think number of rotations) while RCF is the force the tube is experiencing (calculated based on the speed/RPM's and rotor/tube radius). On the smaller centrifuges used in outreach settings, the speed is usually programmed by RPM's. In the standard Hettich EBA 270 centrifuge, 75 mm tubes have a rotor radius of 10.1cm's and 100 mm tubes have a rotor radius of 12.6cm's.
 1. For 16x100mm tubes requiring a force of 1,000-1,300, the RPM's on the Hettich EBA 270 centrifuge would work out to a range of 2,600-3,000.
 2. For 13x75mm tubes requiring a force of 1,100-1,300, the RPM's on the Hettich EBA 270 would work out to a range of 3,100-3,400.
 3. For 13x100mm tubes requiring a force of 1,100-1,300, the RPM's on the Hettich EBA 270 would work out to a range of 2,800-3,000.
5. When time has expired, the mechanical timer will ring a bell. **Do not open yet**, as most centrifuges have an automatic brake (reverse current) that will slow the rotor to a stop in less than a minute. Once the unit has come to a complete stop, an electric beep will sound. It is now safe to open the centrifuge.