

## Laboratory Equipment Maintenance

### ANALYZER MAINTENANCE

Unlike hospital laboratories, many laboratories in physician offices, or clinics, may not have extra instruments to serve as “back-up” should a piece of equipment break down or stop operating properly. This means that instrument down-time is truly time lost for testing, and this inability to provide expected on-site testing can have a serious impact on a busy practice or clinic where physicians are accustomed to receiving laboratory results while they are seeing patients. One of the easiest ways to minimize instrument breakdown or erratic behavior is to have a regular program of instrument maintenance.

Complete an instrument information and maintenance/service record form for each piece of laboratory equipment (see the last page of this LabFacts for a sample form). This form will give you immediate access to important information should an instrument require service, and will allow you to better assess the service costs of your equipment.

When you purchase a piece of equipment, carefully read the operator’s manual. The manufacturer will list what routine maintenance is necessary and at what intervals it should be performed. Record this information, as well as the page on which the service is described, on the form. This way you will not have to go leafing through the operator’s manual for maintenance information. If the service is somewhat complicated (e.g. checking the brushes in a centrifuge) the manual will give specific instructions. Many times the required maintenance is merely a good cleaning of optical elements.

There are a variety of ways to keep instrument preventative maintenance up-to-date. One of the easiest is to have a master laboratory calendar and record the maintenance schedule for each piece of equipment on the master calendar. Record all routine maintenance procedures on the form. Keep all operator’s manuals and the equipment forms near each other in a designated place in the laboratory. Inform every staff member who works in the lab where this material is kept.

In addition to the instrument analyzers, routine maintenance must also be performed on the microscopes and centrifuges used in the laboratory.

### CENTRIFUGE MAINTENANCE

Centrifuges are extremely sturdy pieces of equipment and usually require very little attention. There are, however, a few basic procedures that you should perform to keep a centrifuge in good operating condition.

1. Read the operator’s manual. This is extremely important. Your manual will specify a maintenance program. It will also explain how to “balance” tubes in that particular centrifuge, and if you need to check the brushes, it will give a detailed description of how and when to do so.
2. For your safety, the centrifuge should have a lid to prevent aerosols. Centrifuging only capped tubes does not suffice since tubes may break. If your centrifuge does not have a cover, ask the manufacturer or your laboratory supplier how to obtain one. If you are using a centrifuge from your reference laboratory, request that they furnish you with a lid.
3. Set up a scheduled maintenance program as described in the operator’s manual.
  - Check brushes.
  - Check rubber feet.
  - Replace rubber capillary tube gaskets used to cushion microhematocrit tubes, if required.
4. It is a good idea to have replacement parts such as brushes and gaskets available.
5. Always balance tubes as you put them in the centrifuge. An unbalanced load can cause a centrifuge to “walk” across the bench, possibly falling to the floor. To prevent this from happening, make sure that everyone who uses the centrifuge knows how to balance it.
6. Keep the inside of the centrifuge clean. Clean up all spills and wipe out the inside of the centrifuge regularly with a disinfectant such as 10 percent bleach.

Requirements for good laboratory practice and COLA Laboratory Accreditation programs are underlined.

# LABFACTS 51

Requirements for good laboratory practice and COLA Laboratory Accreditation programs are underlined.

7. It is not necessary to check the speed of the centrifuge by monitoring the RPM (revolutions per minute), unless it is being used as part of a test system. If the test procedure requires that a specimen be centrifuged at a particular speed, then the laboratory will need to confirm at least once per year that the centrifuge spins at the speed noted in the procedure.

## **MICROSCOPE MAINTENANCE**

A properly maintained microscope, should last for many years, and rarely, if ever, require professional service. To maintain your microscope you will need:

### **Lens paper**

Lens paper may be ordered from a scientific supply company or purchased from a camera shop. Do not use regular paper or tissue to clean the optics of a microscope--these can scratch the glass surface. Large sheets of lens paper may be cut into two-inch squares and kept next to the microscope in the top half of an empty cardboard slide box. This makes it easy to wipe oil off the oil immersion objective or to clean the eyepieces.

### **Dust cover**

Covering the microscope at night can prevent dust from collecting on eyepieces, condensers, and the light source and keep dust from working its way into mechanical parts.

### **Lens cleaner**

Use methanol or camera lens cleaner.

### **Small cotton-tipped swabs**

Use swabs to clean hard to reach areas.

if you're having problems with your microscope, following are some tips on how to resolve them:

### **Dirt in your field of view**

This is the most common problem and the most easily solved. The "dirt" can be on several different surfaces including eyeglass lenses and the microscope's eyepieces. Note that dirt on your glasses or the eyepieces appears to be in focus when looking through the microscope, while dirt on the objects produces a blurry image no matter how much you focus.

If you wear eyeglasses and see dirt, jiggle your glasses as you look through the microscope at a lighted field. If the "dirt" moves, clean your glasses and check the lenses for scratches. Dirt may also be on the microscope's eyepieces. Rotate each eyepiece separately while looking through the microscope at a lighted field. If the "dirt" moves, then it is on the eyepiece. Wipe the outside of the eyepiece with a piece of lens paper. Recheck, by looking through the eyepiece again and rotating it. Routine daily care is essential to microscope maintenance. Be sure to complete the following steps on a daily basis:

### **Eyepieces**

Wipe the outside lens surface with lens paper as needed.

### **Objectives**

Never leave the oil immersion objective sitting in oil. Always wipe immersion oil off the lens surface immediately after each use. Failure to do this is the main cause of professional service or new parts. If the high dry objective is dragged through oil as you switch objectives, or if urine or other fluids gets onto any objective, clean it immediately.

### **Stage**

Whenever anything is spilled on the stage, wipe it off with gauze or an alcohol wipe.

### **Condenser**

Wipe off the lens surface with a piece of lens paper dampened with alcohol or lens cleaner.

### **Light source**

Wipe off with a piece of lens paper dampened with alcohol or lens cleaner or use an alcohol wipe.

If the daily cleaning procedures are not sufficient to correct a problem, refer to the operator's manual. These manuals usually offer troubleshooting advice and instructions on how to thoroughly clean a microscope. Arrangements can also be made to send a staff member to another local laboratory to learn how to thoroughly clean a microscope.

# Laboratory Equipment Information and Maintenance/Service Record

Equipment \_\_\_\_\_

Manufacturer's Name \_\_\_\_\_

Phone \_\_\_\_\_

Address \_\_\_\_\_

Model Number \_\_\_\_\_ Serial Number \_\_\_\_\_

Date of Purchase \_\_\_\_\_ Purchase Price \_\_\_\_\_

Supplier's Name \_\_\_\_\_

Phone \_\_\_\_\_

Address \_\_\_\_\_

Warranty Period \_\_\_\_\_

## PROBLEM HOTLINE

Service Contract: yes or no Time period \_\_\_\_\_ Cost \_\_\_\_\_

Service Person's Name \_\_\_\_\_

Phone \_\_\_\_\_

Address \_\_\_\_\_

## RECOMMENDED MAINTENANCE PROCEDURES and SUGGESTED INTERVALS

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## ROUTINE MAINTENANCE AND SERVICE RECORD

Date	Problem	How Fixed	By Whom	Cost
------	---------	-----------	---------	------

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____