Equipment management

Equipment management is one of the essential elements of a quality management system. Proper management of the equipment in the laboratory is necessary to ensure accurate, reliable, and timely testing.

The benefits of a good equipment management program are many:

• helps to maintain a high level of laboratory performance;

• reduces variation in test results, and improves the technologist's confidence in the accuracy of testing results;

• lowers repair costs, as fewer repairs will be needed for a well-maintained instrument;

• lengthens instrument life;

• reduces interruption of services due to breakdowns and failures;

• increases safety for workers;

• produces greater customer satisfaction.

Program considerations of equipment.

A great deal of thought and planning should go into equipment management.

As the laboratory puts an equipment management program in place the following

elements should be considered:

• **Selection and purchasing**—When obtaining new equipment what criteria should be used to select equipment? Should equipment be purchased, or would it be better to lease?

• **Installation**—For new equipment, what are the installation requirements, and who will install the new instrument?

• **Calibration and performance evaluation**—What is needed to calibrate and validate that the equipment is operating correctly? How will these important procedures be conducted for both old and new instruments?

• **Maintenance**—What maintenance schedule is recommended by the manufacturer? Will the laboratory need additional preventive maintenanceprocedures? Are current maintenance procedures being conducted properly?

• **Troubleshooting**—Is there a clear procedure for troubleshooting for each instrument?

• **Service and repair**—What is the cost? Can the laboratory obtain the necessary service and repair in its geographical area?

• **Retiring and disposing of equipment**—What must be done to dispose of old equipment when it needs to be replaced?

Selecting equipment

Selecting the best instrument for the laboratory is a very important part of equipment management. Some criteria to consider when selecting laboratory equipment are listed below.

• Why and how will the equipment be used? The instrument should be matched against the service the laboratory provides.

• What are the performance characteristics of the instrument? Is it sufficiently accurate and reproducible to suit the needs of the testing to be done?

• What are the facility requirements, including the requirements for physical space?

• Will the cost of the equipment be within the laboratory's budget?

• Will reagents be readily available?

• Will reagents be provided free of charge for a limited period of time? If so,

for how long?

• How easy will it be for staff to operate?

• Will instructions be available in a language that is understood?

• Is there a retailer for the equipment in the country, with available services?

• Does the equipment have a warranty?

• Are there any safety issues to consider?

purchasing :

• wiring diagrams, computer software information, a list of parts needed, and an operator's manual are provided;

• the manufacturer will install the equipment and train staff (covering travel expenses as necessary) as part of the purchase price;

• The warranty includes a trial period to verify that the instrument performs as expected;

• The manufacturer's maintenance can be included in the contract and if so, whether maintenance is provided on a regular basis. Determine if the laboratory can provide all the necessary physical requirements, such as electricity, water, and space. There must be adequate room to move the equipment into the laboratory; consider door openings and elevator access.

After installation

After equipment has been installed, the following details need to be addressed before putting the equipment into service:

• assign responsibility for performing the maintenance and operation programs;

• develop a system for recording the use of parts and supplies .

• implement a written plan for calibration, performance verification, and proper operation of the equipment;

• establish a scheduled maintenance program that includes daily, weekly, and monthly maintenance tasks;

• provide training for all operators; only personnel who have been trained specifically to properly use the equipment should be authorized as operators.

Equipment calibration

Follow the manufacturer's directions carefully when performing the initial calibration of the instrument.

It is a good idea to calibrate the instrument with each test run, when first putting it into service. Determine how often the instrument will need to be recalibrated, based on its stability and on manufacturer's recommendation. It may be advantageous to use calibrators provided by or purchased from the manufacturer.

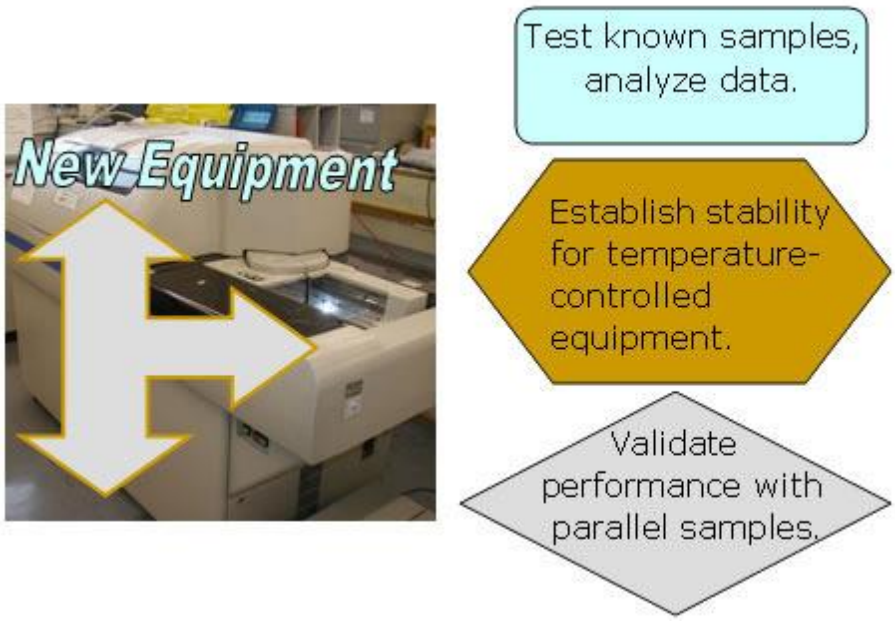
Performance evaluation

Prior to testing patient specimens, it is important to evaluate the performance of new equipment to ensure it is working correctly with respect to accuracy and precision.

Some of the steps that should be followed to verify performance include:

• testing samples with known values and comparing the results to the expected or certified value;

• if equipment is temperature controlled, establishing the stability and uniformity of the temperature.



Preventive maintenance

Preventive maintenance includes measures such as systematic and routine cleaning, adjustment, and replacement of equipment parts at scheduled intervals.

Manufacturers generally recommend a set of equipment maintenance tasks that should be performed at regular intervals: daily, weekly, monthly, or yearly.

Following these recommendations will ensure that the equipment performs at maximum efficiency and will increase the lifespan of the equipment. This will also help to prevent:

- **inaccurate test results due to equipment failure**
- **delays in reporting results**
- **lower productivity**
- **large repair costs.**

Equipment inventory

The laboratory should keep an inventory log of all equipment in the laboratory.

The log should be updated with information on new equipment, as it is added, and include documentation of when old equipment is retired.

For each piece of equipment, the equipment inventory log should have a record of:

• instrument type, make and model number, and serial number of the instrument, so that any problems can be discussed with the manufacturer;

• Date the equipment was purchased, and whether it was purchased new, used, or reconditioned;

• manufacturer/vendor contact information;

• presence or absence of documentation, spare parts, and maintenance contract;

• warranty's expiration date;

• specific inventory number indicating the year of acquisition; this is especially useful for larger laboratories. For example, use the style "YY-number" (04- 001, 04-002,

etc.) where “YY-number” equals the last two numbers of the year followed by a number attributed in the year.