GLP: GOOD LABORATORY PRACTICE

- **GLP** is an FDA regulation.
- **Definition**: GLP embodies a set of principles that provides a framework within which laboratory studies are planned performed, monitored, reported and archived.
- GLP is sometimes confused with the standards of laboratory safety like wearing, safety goggles. etc..

HISTORY

- GLP is a formal regulation that was created by the FDA (United states food and drug administration) in 1978.
- In 1981 an organization named OECD (organization for economic co-operation and development) produced GLP principles that are international standard.

WHY WAS GLP CREATED..??

- In the early 70's FDA became aware of cases of poor laboratory practice all over the United States.
- FDA decided to do an in-depth investigation on 40 toxicology labs.
- They discovered a lot fraudulent activities and a lot of poor lab practices.
- Examples of some of these poor lab practices found were

1. Equipment not been calibrated to standard form , therefore giving wrong measurements.
2. Incorrect/inaccurate accounts of the actual lab study.
3. Inadequate test systems.

FAMOUS EXAMPLE

- One of the labs that went under such an investigation made headline news.
- The name of the Lab was Industrial Bio Test. This was a big lab that ran tests for big companies such as Procter and Gamble.
- It was discovered that mice that they had used to test cosmetics such as lotion and deodorants had developed cancer and died.
- Industrial Bio Test lab threw the dead mice and covered results deeming the products good for human consumption.
- Those involved in production, distribution and sales for the lab eventually served jail time

OBJECTIVES OF GLP

- GLP makes sure that the data submitted are a true reflection of the results that are obtained during the study.
- GLP also makes sure that data is traceable.
- Promotes international acceptance of tests.

What is GLP..??

- Good Laboratory Practice is an essential part of Good Manufacturing Practice detailed in Schedule M to the Drugs & Cosmetic Rule.
- It involves a number of good practices in the Quality Control laboratory which are to be undertaken to carry out an analysis with a defined degree of Accuracy & Precision

GMP vs. GLP

- **Samples** → **Laboratory Processes** → **Results of Analysis**

Good Laboratory Practices

Raw Materials Packaging Materials → **Manufacturing Processes** → **Finished Product of Standard Quality**

Good Manufacturing Practices

The Purpose of a Laboratory Quality Assurance Program

- The purpose of the quality assurance program is to assure that all laboratory testing is performed according to the principles of current Good Laboratory Practice (cGLP).
- This is carried out by the quality assurance department which has the authority to authorize all quality related documentation.
- The quality assurance department is staffed by individuals who are knowledgeable of, and familiar with, the laboratory testing.

Quality Assurance; Establishing Confidence in Reported Data

- **Elements of Good Laboratory Practice**

✓Standard Operating Procedures (SOP's).
✓ Statistical procedures for data evaluation
✓ Instrumentation validation
✓ Reagent/materials certification
✓ Analyst certification
✓Lab facilities certification
✓Specimen/Sample tracking

Standard Operating Procedures (SOP)

- Written procedures for a laboratories program.
- They define how to carry out protocol-specified activities.
- Most often written in a chronological listing of action steps.
- They are written to explain how the procedures are suppose to work

SOP

- Routine inspection, cleaning, maintenance, testing and calibration.
- Actions to be taken in response to equipment failure.
- Analytical methods
- Definition of raw data
- Keeping records, reporting, storage, mixing, and retrieval of data

Statistical Procedures For Data Evaluation

- Statistical procedures are not simply chosen from a text book
- Practitioners in a particular field may adopt certain standards which are deemed acceptable within that field.
- Regulatory agencies often describe acceptable statistical procedures

Instrumentation Validation

- This is a process necessary for any analytical laboratory.
- Data produced by "faulty" instruments may give the appearance of valid data.
- The frequency for calibration, re-validation and testing depends on the instrument and extent of its use in the laboratory.
- Whenever an instrument's performance is outside the "control limits" reports must be discontinued

Instrument Validation (cont)

- **Equipment records should include:**

1. Name of the equipment and manufacturer
2. Model or type for identification
3. Serial number
4. Date equipment was received in the laboratory
5. Copy of manufacturers operating instruction

Reagent/ Materials Certification

- This policy is to assure that reagents used are specified in the standard operating procedure.

- Purchasing and testing should be handled by a quality assurance program.

Reagents And Solutions (cont)

➢ **Requirements:**

- Reagents and solutions shall be labeled
- Deteriorated or outdated reagents and solutions shall not be used
- Include Date opened
- Stored under ambient temperature
- Expiration date

Analyst Certification

- Some acceptable proof of satisfactory training and/or competence with specific laboratory procedures must be established for each analyst.
- Qualification can come from education, experience or additional trainings, but it should be documented
- Sufficient people
- Requirements of certification vary

Laboratory Certification

- Normally done by an external agency
- Evaluation is concerned with issues such as
- Adequate space
- Ventilation
- Storage
- Hygiene

Specimen/Sample Tracking

- Vary among laboratories
- Must maintain the unmistakable connection between a set of analytical data and the specimen and/or samples from which they were obtained.
- Original source of specimen/sample (s) must be recorded and unmistakably connected with the set of analytical

Documentation And Maintenance of Records

- Maintenance of all records provide documentation which may be required in the event of legal challenges due to repercussions of decisions based on the original analytical results.
- General guidelines followed in regulated laboratories is to maintain records for at least five years
- Length of time over which laboratory records should be maintained will vary with the situation

Documentation & Records

- **Usual Document and records with which Q.C Laboratory has to deal with are –**

- Specification
- Test Procedure
- Standard Operating Procedures
- Certificate of Analysis with relevant Test Protocols
- Sample Register
- Register for Reference Standards & Reference Cultures
- Calibration Records
- Validation Records
- Training Records

Documents And Records (cont)

- Records for Retained samples (Both finished products & active raw materials)
- Records pertaining to the preparation of solutions of reference standards, volumetric solutions and other reagents.
- Log book for instruments & equipment's.
- All documents are to be reviewed periodically and updated whenever required.
- Records should be maintained in such a manner that these are always traceable.
- If required help of electronic data processing system may be taken.

What happens if a workplace does not comply with federal Good Laboratory Practice standards..???

Disqualification Of A Facility

- Before a workplace can experience the consequences of noncompliance, an explanation of disqualification is needed
- The FDA states the purpose of disqualification as the exclusion of a testing facility from completing laboratory studies or starting any new studies due to not following the standards of compliance set by the Good Laboratory Practice manual

Grounds For Disqualification

- The testing facility failed to comply with one or more regulations implemented by the GLP manual
- The failure to comply led to adverse outcomes in the data; in other words, it affected the validity of the study
- Warnings or rejection of previous studies have not been adequate to improve the facility's compliance

Consequences Of Noncompliance

- **The FDA states the following consequences of noncompliance:**
  - The commissioner will send a written proposal of disqualification to the testing facility
  - A regulatory hearing on the disqualification will be scheduled
  - If the commissioner finds that after the hearing, the facility has complied, then a written statement with an explanation of termination of disqualification will be sent to the facility
  - Thus, if it can be shown that such disqualifications did not affect the integrity and outcome of the study itself, or did not occur at all, then the study may be reinstated at the will of the commissioner.

Upon Disqualification…

If the commissioner finds that the facility was noncompliant on any of the grounds after the hearing, then a final order of noncompliance will be sent to the facility with explanations :

1. If a testing facility has been disqualified, any studies done before of after the disqualification will need to be determined as essential to a decision (acceptable or not)
2. If the study is determined unacceptable, then the facility itself may need to show that the study was not affected by the noncompliance that led to the disqualification
3. Once finally disqualified, the facility may not receive or be considered for a research or marketing permit and the study is rejected.

Upon Disqualification

- The FDA may turn it over to the federal, state or local law enforcement
- The facility's sponsor may terminate or suspend the facility from doing any non-clinical study for a permit.
- The sponsor is required to notify the FDA in writing within 15 working days that the facility is to be suspended or terminated.

Reinstatement Of A Disqualified Facility

- The disqualified facility will be required to put in writing to the commissioner reasons why it should be reinstated and any actions the facility will take or have taken to assure any disqualification problems will not happen again

1. The commissioner will inspect the facility and determine if it shall be reinstated
2. If it is reinstated, the commissioner is required to notify all persons that were notified of the disqualification including the facility itself .

CONCLUSION

- In conclusion one must realize that in the pharmaceutical industry there is no margin for error and one must follow good practices in the laboratory to generate accurate, precise and reliable data.


So Start GLP

References

1. http://www.sjsu.edu/faculty/chem55/55glpout.htm
2. http://www.labcompliance.com/tutorial/glp/default.aspx?sm=d_a
3. UGA Office of the Vice President for Research
4. Wikipedia


Thank You