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Investigating Out-of-Specification Results and Development CAPA Program for Pharmaceutical Industries: An Overview

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ABSTRACT

A well designed and implemented corrective and preventive action (CAPA) offers a mechanism for obtaining critical quality data in a timely manner to enable quick response to out-of-specification (OOS), early warning of potential failures and redeployment of resources to problematic areas. This article presents the key features of CAPA program and provides the current thinking on how to evaluate out-of-specification test results that can lead to detection and resolution of out-of-specification test results for pharmaceutical production. In order to solve OOS, every organization must know how to conduct an effective investigation, identify root causes and implement workable corrective action in a timely manner that can help prevent potential problems in the future.

Key words: CAPA, OOS, FTA, QMS

INTRODUCTION

CAPA is a fundamental management tool that should be used in every quality system. This program provides a simple step by step process for completing and documenting corrective or preventive actions. The result will be a complete, well documented investigation and solution that will satisfy regulatory requirements and form the basis for an effective continuous improvement plan for any company. Properly documented actions provide important historical data for a continuous quality improvement plan and are essential for any product that must meet regulatory requirements demanded by FDA and ISO and other quality systems [1].

1.0 Quality Management System (QMS)

A quality system is a set of formalized business practices that define management responsibilities for organizational structure, processes, procedures and resources needed to fulfill product or service requirements, customer satisfaction and continuous improvement. A

quality management system (QMS) is a set of interrelated processes used to direct and control an organization with regard to quality. In other words, a quality system dictates how quality policies are implemented and quality objectives are achieved [1].

Continuous improvement is the result of ongoing activities to evaluate and enhance products, processes and the entire quality system to increase effectiveness. The organization must continuously improve the effectiveness and efficacy of its QMS through the use of its quality policy, quality objectives, audit results, analysis of data, corrective and preventive action (CAPA) [1,2].

Quality systems are regulated by the Food and Drug Administration (FDA) under 21 CFR Part 820, referred to as the "Quality System regulation" (QSR). In order to provide FDA inspectors with guidelines on how to evaluate compliance with the issues outlined in the QSR, the FDA produced the Quality Systems Inspection Technique (QSIT). QSIT focuses on four key subsystems as primary indicators of QSR compliance and provides guidelines for evaluating each. These four subsystems are management controls, design controls, corrective and preventive action (CAPA) and production and process controls, are considered the basic foundation of a quality system. The remaining three subsystems of the QSR (Facilities and Equipment Controls, Materials Controls and Documents/ Records/Change Controls) can be looked at while evaluating the other four [2,3].

2.0 Corrective And Preventive Action (CAPA)

Corrective action is one of the most important improvement activities. CAPA identifies actions needed to correct the causes of identified problems and seeks to eliminate permanently the causes of problems that have a negative impact on systems, processes and products. Corrective action involves finding the causes of some specific problem and then putting in place the necessary actions to avoid a reoccurrence. Preventive actions are aimed at preventing the occurrence of potential problems. Correction of the problem is the third basic element of the corrective and preventive action system [1,3,4].

CAPA is a widely accepted concept to any quality management system. Within the United States, lack of adequate investigations, no true root cause analysis, lack of effective corrective actions and lack of true preventive actions are common findings pointed out by FDA inspectors. As evidenced by the significant number of problems related to this issue, companies are facing many challenges in making the CAPA system work as planned. Life sciences regulated companies must ensure that their CAPA system looks beyond product issues and considers other quality issues including problems associated with processes and systems. CAPA systems are inherently data driven. Without adequate, relevant data, it can be difficult to draw definitive conclusions about systems, processes or product quality issues. One of the challenges many companies face is the proliferation of uncorrelated data repository systems within the organization [5]. By having a correlated CAPA system, a company will be better able to diagnose the health of its quality system and will have a better chance of recognizing and resolving important quality issues. Companies must establish methods to evaluate both the nonconformance data (which will feed the corrective action portion of the system) and the in-conformance data (which will be the basis of preventive actions) [1,6].

The four key CAPA definitions are:

- **CAPA (corrective and preventive action):** A systematic approach that includes actions needed to correct (correction), avoid recurrence (corrective action) and eliminate the cause of potential nonconforming product and other quality problems (preventive action).
- **Correction:** Action to eliminate a detected nonconformity. Corrections typically are one-time fixes. A correction is an immediate solution such as repair or rework. Corrections are also known as remedial or containment action.
- **Corrective action:** Action to eliminate the causes of a detected nonconformity or other undesirable situation. The corrective action should eliminate the recurrence of the issues.
- **Preventive action:** Action to eliminate the cause of a potential nonconformity or other undesirable potential situation. Preventive action should prevent the occurrence of the potential issues [1,9,10].

2.1 CAPA Relationship with Quality Subsystems

The CAPA system is a critical component of an effective QMS and it must maintain a close relationship with other quality subsystems (Fig 1). The ultimate goal of any regulated company must be to have a CAPA system that is compliant, effective and efficient. All relevant subsystems that may produce non-conformances must be part of the process. Internal processes encompass both non-conformance and in-conformance results, internal audits and assessments, management reviews and so on. External sources of CAPA process inputs are supplier audits and assessments, customer feedback and results from external audits and assessment such as regulatory agencies, ISO and so on [1,11].

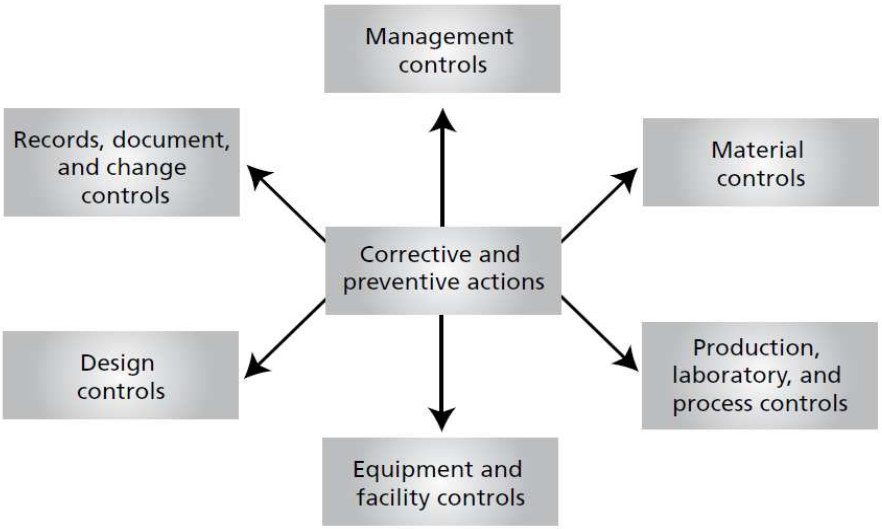

Fig 1 CAPA and manufacturing quality system

2.2 Central Role of the CAPA Subsystem

The CAPA subsystem (21 CFR 820.100), one of the most important quality system elements, is the other major theme that makes QSIT a unique inspection process. The FDA views CAPA as being directly linked to all of the other subsystems. Corrective action refers to elimination of the causes of quality problems in order to prevent recurrence, preventive action is the steps taken to eliminate the cause of a potential problem in order to prevent its occurrence [2,12,14].

Under 21 CFR 820.100, CAPA procedures should include requirements for:

- **Identifying existing and potential causes of quality problems:** Internal data sources may include inspection and test data, process control data, equipment calibration and maintenance data, device history records, change control records, out-of-specification and nonconforming material reports. External data sources can include field service reports, legal claims, product warranties and complaints from customers, employees and the FDA.

- **Failure investigation:** An investigation should be carried out to determine the root cause of a quality problem. The investigation should ask whether procedures were followed and whether there was appropriate control to prevent distribution of the defective product. The magnitude of the investigation should correlate with the significance and risk of the problem.

- **Determining appropriate corrective and preventive action:** Actions should be identified to correct the quality problem and prevent its recurrence. Similarly, procedures should be in place to allow the recognition and solution of a potential problem to avoid its occurrence. Such actions should be verified to ensure that they are effective and do not have an adverse effect on the products [13,15].

- **Changing procedures:** Methods and procedures should be changed to incorporate the CAPA. People directly responsible for quality assurance should be provided with information regarding quality problems and procedural changes [16].

- **Management review:** Relevant information on problems and the corrective and preventive actions taken should be submitted to management for review.

2.3 Benefits of Unified CAPA System [17]

1. Financial

- Influence Technologies
- Opportunities for prevention
- Simplification through elimination of manual steps
- Lowers cost through centralized functions

2. Consistency

- Uniform processing
- Common Language

3. Compliance

- Readily retrievable information
- Faster proactive analysis
- Connects the dots to identify systemic issues
- Visibility for cross-site issues (e.g. inspections and supplier problems**)**

4. Management Control

- Early alert system that facilitates prevention
- Instantaneous, real-time view of company-wide issues
- Improved communication and teamwork
- Facilitates integrated trending for large volumes of data
- Linkage among sites for products that are sold as a system

2.4 Importance of Management Controls

All problems can and will likely be traced to management:

- design, process, product and CAPA
- Management Controls encompass all other subsystems

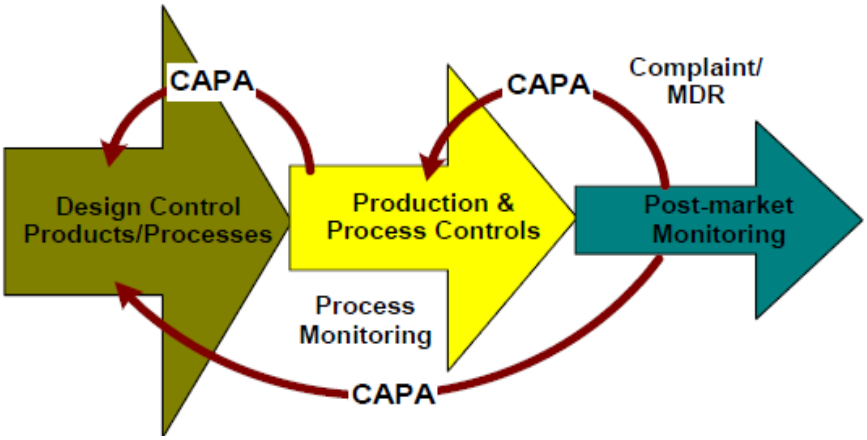

Fig. 2 Management control

2.5 Inputs to CAPA System [17]

CAPA is central to the implementation of an effective, closed loop and continuous improvement process that focuses on prevention and quality.

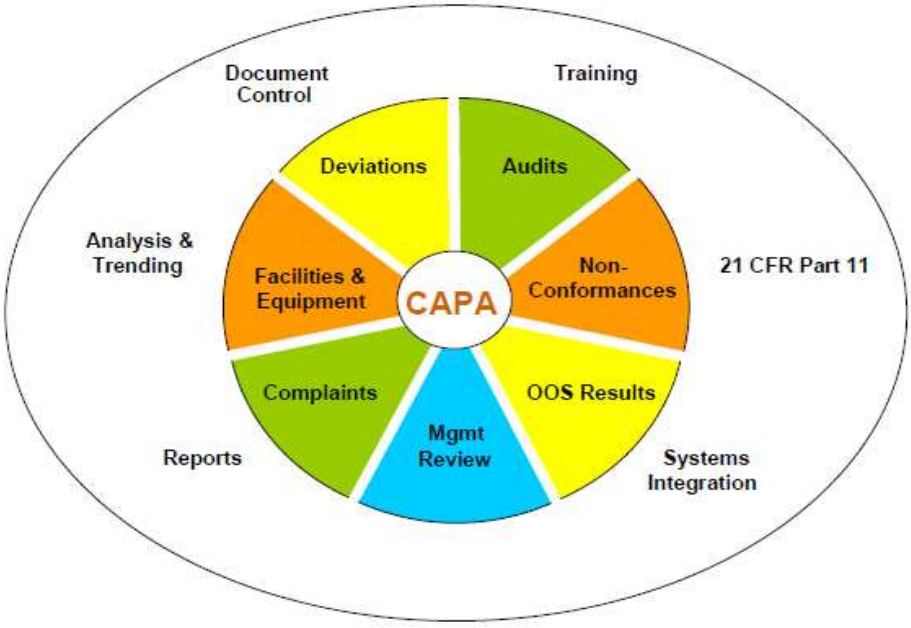

Fig. 3 Closed-loop compliance process control

2.6 Common CAPA Violations [4,22]

- No established procedures for implementing CAPA
- No true root-cause analysis, failure investigations inadequate
- Complaint handling too specific, do not look at overall system
- Failure to document CAPA action
- No validation
- Failure to designate & document executive responsibilities
- Infrequent quality audits
- Inadequate procedures for quality audits
- Inadequate procedures for documenting CAPA

2.7 When is CAPA Relevant [5,29]

Currently, there are five different types of information sources that can trigger a CAPA.

- Complaints from customers, either direct or indirect users (consumers).
- Process deviations as a result of a manufacturing inconsistency or production failure, or an engineering non-conformity, which causes the defect relative to the production deviation, non-conformance or out-of-specification that may occur [26].
- Laboratory investigation or analyses.
- Internal audits or audits from regulatory bodies such as the FDA that identify differences or deviations from given standards in the business or production processes or non-compliance to production validation guidelines.
- Grassroots efforts by employees, e.g., an engineer who notices an oil spill and organizes a corrective action.

2.8 CAPA News [17]

In CDRH Warning Letter observations between April and September 2006, CAPA ranks #1

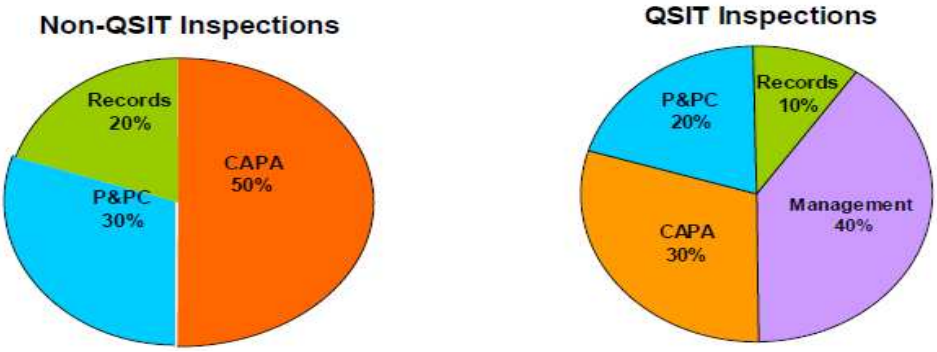

Fig. 4 FDA and QSIT workshop on CAPA

3.0 Industry's Common Failings

It seems that one of the biggest challenges for companies is to complete investigations and actions in a timely manner. In many cases, incorrect assumptions are made that everything is an isolated incident. In other instances, problems are not corrected and everything is blamed on a single employee or a simple laboratory error or the system fails to ensure that a problem does not extend to other lots and the incident recurs. The ultimate criterion for adequate correction is to ensure that it doesn't happen again. CAPA was adopted as a new quality management tool following the introduction of the ICH Q10 guideline. According to the ICH Q10 document, which was adopted by the FDA in April 2009 as an industry guideline, a pharmaceutical Quality Management System (QMS) consists of four central elements:

- Process performance and product quality monitoring
- Corrective action and preventive actions
- Change management
- Management review of process performance and product quality.

The guideline states that a pharmaceutical company should have a system in place to detect and evaluate non-conformances to take respective corrective and preventive actions. Among other things, the information regarding non-conformances can result from complaints, deviations, recalls, observations at audits and inspections, or from monitoring findings. The examinations within the system must have the objective of determining the actual root cause. As a result, the process and product should be better understood so that improvements can be derived from it.

The EU Commission has now published a suggestion for the revision of chapter 1 of the EU GMP Guide to incorporate the recommendations of ICH Q10. Now, specific requirements for a CAPA system shall be included. Accordingly, the extent of the actions, technical complexity and documentation of the necessary CAPA actions has to be managed according to a risk assessment.

4.0 FDA warning letter

An FDA warning letter serves as a formal means of communication for pointing out violations that could lead to legal and administrative sanctions, if such violations are not corrected promptly. While the ISO sector does not have an equivalent of a warning letter, a nonconforming product that is not corrected properly could mean loss of ISO certification and consequently, either loss of opportunities in overseas markets and end of business contracts with customers that require ISO certification. In both FDA and ISO environments, a nonconforming product that causes injury or death could also mean liability lawsuits for the manufacturer [17,18].

4.1Warning Letters Observations

Failure to establish and maintain procedures for implementing corrective and preventive action, as required by 21 CFR 820.100(a).

- Specifically, you failed to verify or validate a corrective and preventive action to ensure that such action is effective and does not adversely affect the finished device, as is required by 21 CFR 820.100(a)(4).
- Specifically, your firm failed to identify the action(s) needed to correct and prevent recurrence of non-conforming product and other quality problems, as required by 21 CFR 820.100(a)(3).
- Specifically, your firm failed to analyze processes, work operations, concessions, quality audit reports, quality records, service records, complaints, returned product, and other sources of quality data to identify existing and potential causes of nonconforming product, or other quality problems, as required by 21 CFR 820.100(a)(1).
- Specifically, your firm failed to investigate the cause of nonconformities relating to product, processes, and the quality system, as required by 21 CFR 820.100(a)(2).

4.2 Impact of Warning Letters

- Public Record
- May affect all Company locations
- Response involves preparation of a costly and lengthy document that provides plan to remedy the problems
- Impact of response can also be costly
- Marred reputation can result in loss of investors, decline in stock value and market share
- Potentially sub-optimal organization resulting from higher turnover and more difficulty in recruiting best talent
- Lower morale/increased stress in work environment

If the manufacturer does not address the areas outlined in the warning letter, FDA can:

- Seize goods
- Declare products misbranded
- Issue injunctions
- Demand product recalls
- Put a stop on application for exports

- Close facilities
- Impose civil and criminal penalties extending to multiple levels of management within the accused organization

4.3 Concluding and Remarks of Warning Letters

1. An effectively implemented centralized global CAPA System will seamlessly integrate data from all quality sub-systems across sites for data collection, analysis, and effective implementation
2. CAPA is a Company Process not a just a "Quality" process
3. The success of a company's CAPA system is dependent upon ability to think critically, caliber of its staff and organization's commitment to the quality
4. A global CAPA program should be smarter:

- Specific
- Measurable
- Action oriented
- Regulation compliant
- Timely
- Effective, and Results driven

5.0 Out-Of-Specification And Capa Program

In 2006, FDA provides guidance "Investigating out-of-specification (OOS) test results for pharmaceutical production" which provides current thinking on how to evaluate out-of-specification test results. The term OOS results includes all test results that fall outside the specifications or acceptance criteria established in drug applications, drug master files (DMF) or by the manufacturer [6].

A common way of handling Out-of-Specification is by fixing the product or material. Increasingly, however, manufacturers realize that they must not only fix existing problems, but also avoid future recurrence of a similar nonconformance. In this sense, the nonconformance disposition process is closely related to the CAPA process.

In the case of FDA-regulated medical device, pharmaceutical, and biotech companies, certain regulations require them to implement CAPA as part of the resolution of material nonconformance issues. Under QSR (21 CFR Part 820.100), medical device manufacturers are required to establish a CAPA procedure that will investigate the cause of any product nonconformance and identify action that would prevent the recurrence of such nonconformance. The CGMP regulations for finished pharmaceuticals similarly require that any failure of a batch, or any of its components, to meet specifications must be thoroughly investigated and documented, including the investigation's follow-up and conclusion (21 CFR Part 211.192).

5.1 Investigations of Out-of-Specification

FDA regulations require that an investigation to be conducted whenever an OOS test result is obtained. The purpose of investigation is to determine the root cause of existing or potential non-conformities and to provide recommendations of solutions. The scope of the investigation should be adequate with the determined risk of the non-conformity. Good practice shows that a documented plan should be in place prior to conducting the investigation [7]. The plan should include:

- Description of the nonconformity expressed as a problem statement
- Scope of the investigation

- Investigation team and their responsibilities
- Description of activities to be performed
- Resources
- Methods and tools
- Timeframe

5.2 Requirements for Investigations [19]

- Under **211.22** the quality unit is required to review production records and investigate any unexplained discrepancies.
- In addition, under **211.22** rejecting incoming materials, in-process materials and drug products. If rejected must conduct an investigation.
- Under **211.22** (a) QU is responsible for approving or rejecting products services provided under **211.22 (a).**
- Under **211.192** a key component of a Quality System is handling nonconformities and deviations.
- In order to meet **211.192** the investigation's Conclusions and follow-up must be documented.
- Meeting **211.192** also requires manufactures to set critical product attributes; specified control parameters and strength as required.
- The accurate measurement of the process and product attributes is also required to meet 211.192.

5.3 FDA Inspections- Investigations

Quality Systems: required to be covered in every inspection whether abbreviated or comprehensive.

Production Systems: is almost always also chosen by Drug Investigators.

Quality Systems Key Items Covered

- Product reviews batches reviewed for each product, trends identified (investigations)
- Complaint reviews (quality and medical)
- Reprocess rework
- Failures
- Rejects
- Corrective actions and preventive actions

Production Systems Key Items Covered

- Justification and consistency of in-process specifications and drug product final specifications
- Master Production and control records
- Batch production and control records
- Documented investigations into unexplained discrepancies

Inspection findings that demonstrate that a firm is not operating in a state of control may be used as evidence for taking appropriate advisory, administrative and or judicial actions.

- **Quality System** is out of control if there is a pattern of failure to conduct investigations and resolve discrepancies, failures, deviations and complaints.
- **Production System** is out of control if there is a pattern of failure to document investigations of deviations.
- **Laboratory System** is out of control if there is a failure to document investigations of deviations.

Investigations of "Out of Specification results" have to be done in cases of:

- Batch release testing and testing of starting materials.
- In-Process Control testing: if data is used for batch calculations/decisions and if in a dossier and on Certificates of Analysis.
- Stability studies on marketed batches of finished products and or active pharmaceutical ingredients, ongoing / follow up stability (no stress tests)
- Previous released batch used as reference sample in an OOS investigation showing OOS or suspect results.
- Batches for clinical trials.
- All solutions and reagents must be retained until all data has been second person verified as being within the defined acceptance criteria.
- Pharmacopoeia have specific criteria for additional analyses of specific tests (i.e. dissolution level specification for S1, S2 & S3 testing; Uniformity of dosage units specification for testing of 20 additional units; Sterility Testing).However if the sample test criteria is usually the first level of testing and a sample has to be tested to the next level this should be investigated as it is not following the normal trend.
- The OOS process is not applicable for In-process testing while trying to achieve a manufacturing process end-point i.e. adjustment of the manufacturing process. (e.g. pH, viscosity), and for studies conducted at variable parameters to check the impact of drift (e.g. process validation at variable parameters).
- Out-of-Specification (OOS) Result**:** Test result that does not comply with the pre-determined acceptance criteria (i.e. for example, filed applications, drug master files, approved marketing submissions, or official compendia or internal acceptance criteria).
- Test results that fall outside of established acceptance criteria which have been established in official compendia and/or by company documentation (i.e., Raw Material Specifications, In-Process/Final Product Testing, etc.).
- Out of Trend (OOT) Result is generally a stability result that does not follow the expected trend, either in comparison with other stability batches or with respect to previous results collected during a stability study. However the trends of starting materials and in-process samples may also yield out of trend data.
- Aberrant and Anomalous Result: Results that are still within specification but are unexpected, questionable, irregular, deviant or abnormal. Examples would be chromatograms that show unexpected peaks, unexpected results for stability test point.

5.4 Laboratory Investigation [6]

FDA regulations require that an investigation be conducted whenever an OOS test result is obtained (211.192). The purpose of the investigation is to determine the cause of the OOS result. The source of the OOS result should be identified either as an aberration of the measurement process or an aberration of the manufacturing process.

5.4.1 cGMP Concepts of Laboratory Investigations [19]

Lab investigations are conducted when there are questionable results.

1. Companies should conduct a review to identify a lab error or need for full investigation.
2. Items that should be evaluated:

- Data-lab note books
- Methods
- Calculations
- Equipment
- Sample integrity

- Reagents, standards used in analysis
- Training

3. Usually results in the following:

- Correctable lab error-further investigation not needed. Error fixed and corrected results used (example wrong calculations).
- Non-correctable lab errors- invalidate results and testing repeated. Investigation concluded.
- No lab error detected- Full Investigation-Quality Review to determine what to do with the batch; Manufacturing Investigation; Retesting performed and additional confirmation testing performed.

5.4.2 Common Reasons for Lab Investigations:

- **Employee:** SOP not followed; stability samples not pulled at right time; misreported data; lack of training; analytical errors; calculation error.
- **Facility:** Lab contamination; no quality management; power failures.
- **Methods:** Unclear written methods; Method limitations; wrong methods used; outdated methods used.
- **Equipment:** calibration failure; calibration frequency inadequate; old equipment; wrong equipment used for testing.

5.4.3 Laboratory investigation procedure: (As describe in figure no. 5)

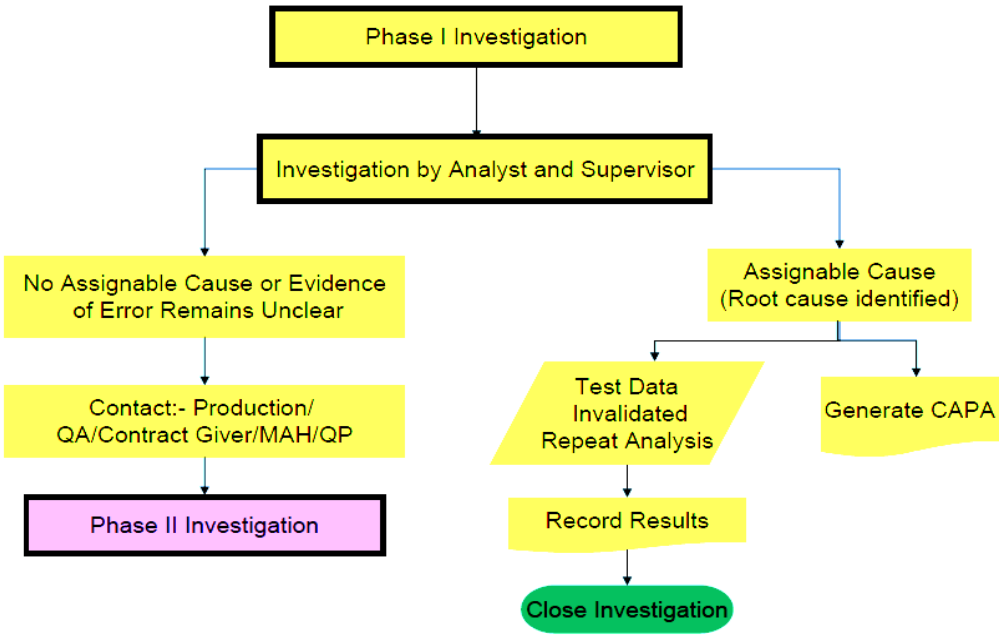

Fig. 5 Laboratory investigation procedure

5.5 Full-Scale OOS Investigation

When the initial assessment does not determine that laboratory error caused the OOS result and testing results appear to be accurate, a full-scale OOS investigation using a predefined procedure should be conducted. This investigation may consist of a production process review and/or additional laboratory work. The objective of such an investigation should be to identify the root cause of the OOS result and take appropriate corrective and preventative action. A full-scale investigation should include a review of production and sampling procedures, and will often include additional laboratory testing. Such investigations should be given the highest priority [6].

5.5.1 cGMP Concepts of Manufacturing Investigations

Part 211.100 Written Procedures, deviations providing written procedures for production and process control designed to assure that the drug products have the identity, strength, quality and purity they purport to have.

Part 211.192 Production Record Review any unexplained discrepancy or the failure of its batch or any of the components to meet predefined specifications.

- Also any other events that can possibly affect product identity, strength, quality, purity, or not following procedures should be investigated and documented. Also quality issues with components, raw materials, bulk received from suppliers should also be investigated.
- Investigations/deviation reports should have a time frame for completion. Usually within 30 calendar days.
- Responsibility crosses groups in an organization. For instance many investigations require the expertise of quality assurance, quality control, production, suppliers, engineering, and technology.
- Companies should have available for review extremely detailed procedures establishing steps that should be followed when documenting deviations [19].

5.5.2 Typical reasons for deviation reports and investigations:

- Deviations from manufacturing or packaging procedures
- Product mix up
- Wrong batch numbers
- Not meeting specifications
- Equipment malfunctions not meeting calibration schedules
- Out of range for yields
- Operating out of the set limits for a piece of equipment
- No training/ employee errors

5.5.3 Full-Scale Laboratory investigation procedure: (As describe in figure no. 6)

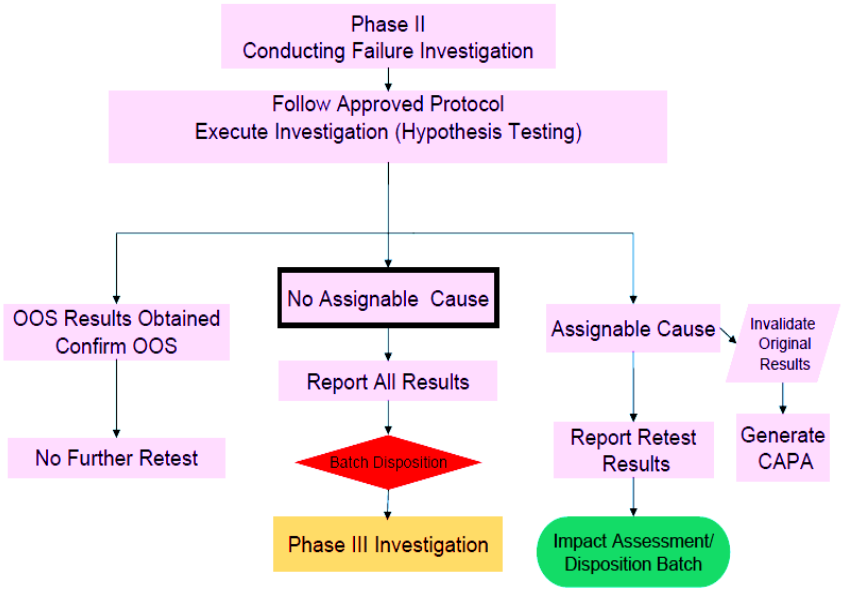

Fig. 6 Full-Scale OOS Investigation

6.0 CAPA procedures [20]

Implementing an effective corrective or preventive action capable of satisfying quality assurance and regulatory documentation requirements is accomplished in six basic steps:

1. Identification

The initial step in the process is to clearly define the problem. It is important to accurately and completely describe the situation as it exists now. This should include the source of the information, a detailed explanation of the problem, the available evidence that a problem exists.

2. Evaluation

The situation that has been described and documented in the "Identification" section should now be evaluated to determine first, the need for action and then the level of action required. The potential impact of the problem and the actual risks to the company and/or customers must be determined. Essentially, the reasons that this problem is a concern must be documented.

3. Investigation

In this step of the process a procedure is written for conducting an investigation into the problem. A written plan helps assure that the investigation is complete and nothing is missed. The procedure should include: an objective for the actions that will be taken, the procedure to be followed, the personnel that will be responsible, and any other anticipated resources needed.

4. Analysis

The investigation procedure that was created is now used to investigate the cause of the problem. The goal of this analysis is primarily to determine the root cause of the problem described, but any contributing causes are also identified. This process involves collecting relevant data, investigating all possible causes, and using the information available to determine the cause of the problem. It is very important to distinguish between the observed symptoms of a problem and the fundamental (root) cause of the problem.

5. Action Plan

By using the results from the Analysis, the optimum method for correcting the situation (or preventing a future occurrence) is determined and an action plan developed. The plan should include, as appropriate: the items to be completed, document changes, any process, procedure, or system changes required, employee training, and any monitors or controls necessary to prevent the problem or a recurrence of the problem. The action plan should also identify the person or persons responsible for completing each task.

6. Follow Up

One of the most fundamental steps in the CAPA process is an evaluation of the actions that were taken. Several key questions must be answered:

- Have all of the objectives of this CAPA been met? (Did the actions correct or prevent the problem and are there assurances that the same situation will not happen again?)
- Have all recommended changes been completed and verified?
- Has appropriate communications and training been implemented to assure that all relevant employees understand the situation and the changes that have been made?

➢ Is there any chance that the actions taken may have had any additional adverse effect on the product or service?

7.0 Challenges of Implementing CAPA

Historically, most organizations have relied upon the wisdom and experience of their internal experts to identify root causes. Experts attempt to solve all problems using their experience of tried and true past solutions. The main pitfall of this strategy, however, is that their solution is completely dependent upon and limited by their expertise. If the root cause happens to lie outside the scope of their expertise levels, they are not likely to find it. Therefore, they must design a series of closely monitored experiments to test their hypotheses and to determine if they are on the right track in locating the root cause. The problem with designing and implementing these experiments is that, they are invasive requiring personnel, equipment, laboratory resources, down time and funding. If the experiment is a failure, the internal experts must repeat the same costly process again: brainstorming another probable cause and conducting yet another experiment. This process can be time-consuming and lower the morale of those involved.

The companies are discovering that deductive reasoning and comparative analysis are faster, easier and more cost-effective ways to identify root cause and implement a corrective action. Several proprietary programs use deductive reasoning and comparative analysis. The primary focus of such processes is improving a diagnostic technique through better data collection. Data is collected using an observed and comparative questioning technique. A unique and simple tool is used to synthesize the collected data into information that tells the root cause story [23].

SUMMARY

In order to solve problems every organization must know how to conduct an effective investigation, identify root causes and implement workable corrective and preventive action in a timely manner. The CAPA process must provide a common model and language within the organization, which allows investigators to master the process quickly and easily. Management of non-conformances and CAPA processes are essential for pharmaceutical companies, although scope of business, culture and existing processes will heavily impact the quality of the product. An efficient CAPA process is a great tool to improve quality systems and processes; the initial effort is worthwhile if it is well planned and performed correctly.

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