A Practical and Scientific Approach to Quality Risk Management is Integral to an Effective Quality System

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PQRI
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Founded by Colonel Eli Lilly in Indianapolis, Indiana in 1876 with a staff of three employees. The Chairman of the Board position was filled by a Lilly family member until 1969. Lilly became a public company and joined the NYSE in 1970.

"And as to the future of this business – it was founded and built on quality and integrity. Don't ever do anything to detract from its integrity.

"If we continue to work and follow those same principles, there are no limits to where we can go."

– J.K. Lilly, Sr. 1946
The attributes of the product that are **critical to the patient** form the basis of quality risk management activities.

a) Quality risk management is used to **guide development of a robust control strategy** which ensures critical quality attributes are attained and preserved (risk assessment).

b) Sound science and engineering are used to **develop the collection of controls** which form the control strategy (risk control).

c) The **capability of the process and robustness of the control strategy** to reproducibly deliver quality product are re-evaluated periodically to ensure continued suitability (risk review).

d) The quality management system **supports use of the concepts of criticality and control strategy**.

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Figure 1: International Conference on Harmonization (ICH Q9) risk management model
Attributes of Quality Risk Management

- Risk is defined as the combination of the probability of occurrence of harm and the severity of harm (ICH Q9)
  - The evaluation of the risk to quality should be based on scientific knowledge and ultimately link to the protection of the patient
- Quality risk management is a valuable component of an effective quality system in the design, execution, and monitoring of making medicine
Quality Risk Management (QRM) is used in product and process design

- QRM methodology is used to identify critical risk areas, determine critical parameters, and develop the control strategy as part of the commercialization process.

QRM in Manufacturing

- In manufacturing, the defined control strategy must be routinely achieved. Good manufacturing practices (e.g., production records, good documentation practices, facility controls) ensure the control strategy is executed as intended. Established controls are appropriate to the type and stage of manufacturing.
QRM to Develop a Control Strategy

- Identify Requirements (e.g., CQAs)
- Preliminary Hazard Analysis
- Manufacturing Process Maps
- Fault Tree Analysis
- Failure Modes and Effects Analysis

Control Strategy

Knowledge (KM)
Elements of Successful QRM in Product and Process Design
How QRM is Built into Quality Management Processes

**WHAT**

- **Design**
  - Product Development
  - Clear requirements to meet both compliance and patient needs
  - Owned by Quality and the business

- **Execute**
  - Manufacturing
  - Distribution

- **Monitor**
  - Drug Product Complaints
  - Effective
  - Efficient
  - Simple
  - Owned by the business with Quality input

**HOW**

- **Integrated Standards**
- **Business Processes**
- **Governance/Management Oversight**
- **Organization**
- Right people
- Right role
- Clear accountability
- Right span of control

**People Capabilities**

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How QRM is Built into Quality Management Processes

Quality Management Processes

- Quality risk management is used in quality systems to classify events, complaints, audit findings, or changes based upon scientific knowledge and ultimately protects the patient. Increasing risk to quality, and therefore the patient, requires an increase in level of effort and formality.

- Key quality management processes include:
  - Notification to Management
  - Deviation Management
  - Change Management
The quality standards are integrated across the design, execute, and monitor activities with consideration for risk at the various stages.

Additionally risk is triaged based on impact of risk to patient for deviations, changes, complaints, etc. and the governance is applied accordingly.
Incorporating Risk Management into Integrated Business Processes

The Operational Excellence Icon

Vision

A manufacturing organization focused on the patient as a source of competitive advantage

Mission

We Make Medicine with Safety First & Quality Always

Outcomes & Principles

- Nobody gets hurt
- Quality Medicine
- Sustainable use of environmental resources
- Reliable supply of medicines
- Seamless new product commercialization
- Efficient and productive

- Establish control, then reduce variability
- An integrated cross-functional organization
- Scientific & Technical Excellence
- Continuous Improvement Mindset

Foundation

Leadership Accountability & Commitment
- Engaged people who know how to make medicine
- Capability
- Character
- Curiosity
- Courage

Manufacturing Operations

- **Engineering Standards**
  - Facilities, maintenance, utilities, etc.

- **Technical Services Standards**
  - Product control strategy, process capability

- **Operational Standards**
  - Role of the Site Team
  - Role of the Process Teams
  - Role of the Site Head
  - Role of Site Functional Leaders
Incorporating Risk Management into the Organization

Leadership play an essential role in sustaining a culture of quality

- Experience and technical proficiency
- Deliver compliance, operational performance, people development and cross-functional integration
- Common dashboard metrics and targets
- Sharing of learning and benchmarking
Incorporating Risk Management into Manufacturing Governance

Cross-functional team structure

- Business Strategy
- Policy
- Portfolio
- Enterprise Goals

- Operational Strategy
- Key Objectives
- Global Governance/Controls
- Performance Targets

- Operational Performance
- Integration
- Resource Deployment
- Local Governance/Controls

- Shop Floor Execution
- Process Control/Monitoring
- Continuous Improvement

Focus Areas and Planning Horizon

- Decades
- Years
- Years/Months
- Months/Days
Incorporating Risk Management into Manufacturing Governance Decision Making

By “Site” – led by Quality

Global Manufacturing Quality Lead Team
(Chaired by Global Head of Quality)

By “Product” – led by Technical Services

Global Manufacturing Science Lead Team
(Chaired by Global Head of Technical Services)
Incorporating Risk Management into Oversight and Metrics

Monitoring Quality Risk

Product & Process

- Global Product Assessment
- Annual product review
- Periodic Product and Process Trending
- Routine product and process monitoring

Quality System

- Global Management Review of Quality Systems
- Site Management Review of Quality Systems
- Periodic Quality System Trending
- Routine quality system monitoring

Site Compliance Report

The site compliance report is an independent assessment of data to monitor quality risk as part of corporate governance.
A Sustained Focus on Quality Risk Management Has Delivered Improvements in Product Quality

Comparison of 2013 Performance to 2007 Baseline

Activity Indicators

- Portfolio Complexity: 50% increase
- Production Volume: 30% increase

Performance Improvement

- Injury Rate: 50% reduction
- Deviation Rate: 40% reduction
- Backlog: 90% reduction
- Customer Service: Sustained

Productivity Improvement

- Inventory: 10% reduction
- Expense: Neutral
- Headcount: 30% reduction
- Capital: 20% reduction
- Losses: 10% reduction
- COPS: 10% reduction

"Take what you find here and make it better and better."
- Colonel Eli Lilly
Lilly’s Quality Risk Management has Enabled a More Effective Quality System and Improved Product Quality

“Quality is fundamentally about trust between our company and the patients who use our products. The quality of Lilly medicines must never be in doubt.”

— John Lechleiter, chairman, president and CEO

Quality
The foundation of everything we do

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