FDAnews: QSR Quality Data and Trending Requirements *13 Sept 2011*

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My Informal FDA Warning letter citations count:

- 820.100(a)(1) 2009 citations ~6
- 820.100(a)(1) 2010 citations ~19
- 820(a)(1) 2011 citations YTD ~14 as of August 2011

Why does/ should the medical industry trend it's quality data

- Regulatory requirements from the FDA, ISO and Ex US regulatory requirements
- Good product performance and *safety* monitoring
- Having an established quality systems data system assists in problem analysis

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QSR Quality Data and Trending Requirements

The purpose of this presentation is to present some of the requirements for the Medical Device industry around quality data and trending as required by the QSR part 820. By the end of the presentation you will have a better understanding of what is required, the extent of the effort, and some ideas on how to accomplish it.

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QSR Quality Data and Trending Requirements

Where do the requirements come from?

- Explicit requirements from the QSR
- Implicit requirements from the QSR
- Implied requirements from warning letters

Global **H**armonization **T**ask **F**orce Quality management system Medical Devices: Guidance on corrective action and preventive action and related QMS processes, Final Report Nov 2010

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QSR Quality Data and Trending Requirements

What are the requirements?

- Data sources
- All sources scrutinized
- Use of statistical tools
- Demonstrate actionable trending
- Quality data systems must be established
- Data system control, content, and validation

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QSR Quality Data and Trending Requirements

Examples of trending tools and data analysis

- Monthly dashboards, scorecards
- Management reviews
- Specific issue deep dives and cross data source searches

Where do the requirements for quality data and trending come from?

Directly from the QSR

820.100(a)(1) Corrective and preventative action. Analyzing 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 non-conforming product, or other quality problems. Appropriate statistical methodology shall be employed where necessary to detect recurring problems.

This is the explicit directive for trending included as part of the requirement to have procedures for corrective and preventive actions.

Where do the requirements for quality data and trending come from?

Directly from the QSR

820.250(a) Statistical techniques. Where appropriate, each manufacturer shall establish and maintain procedures for identifying valid statistical techniques required for establishing, controlling, and verifying the acceptability of process capability and product characteristics.

Your statistical trending must be valid and established.

Where do the requirements for quality data and trending come from?

Indirectly from the QSR

> 820.20(c) Management Review. Management with executive responsibility shall review the suitability and effectiveness of the quality system at defined intervals and with sufficient frequency according to established procedures to ensure that the quality system satisfies the requirements of this part and the manufacturer's established quality policy and objectives.

How can you have a management review without data?

Where do the requirements for quality data and trending come from?

Indirectly from the QSR

820.70(a) Production and process controls. General. Each manufacturer shall develop, conduct control and monitor production processes to ensure that a device conforms to it's specifications. …the manufacturer shall establish and maintain process control procedures that describe any process controls necessary to ensure conformance to specifications. Where process controls are needed they shall include:

820.70(a) (2) Monitoring and control of process parameters and component device characteristics during production

Any and all of this type of data could be considered 'Quality Data'

Where do the requirements for quality data and trending come from?

Indirectly from the QSR

820.198 Complaint Files(c). Any Complaint involving the possible failure of a device, labeling, or packaging to meet any of its specifications shall be reviewed, evaluated, and investigated unless such investigation has already been performed for a similar complaint and another investigation is not necessary

How can you tell if another complaint exists without the data.

Where do the requirements for quality data and trending come from?

- Sec. 820.200 Servicing.
  - (b) Each manufacturer shall analyze service reports with appropriate statistical methodology in accordance with 820.100.
- A shout back to the 820.100(a)(1) paragraph, but recently referenced in a warning letter

Where do the requirements for quality data and trending come from? *Indications from warning letters*

WL 6 January 2009

1. Failure to analyze and trend non-conformances, complaints, and other sources of quality data to identify existing and potential causes of nonconforming products, or other quality problems, as required by 21 C.F.R. § 820.100(a)(1). For example:
   - A review of your customer returns database from September 30, 2007, to October 1, 2008, revealed that of the 209,275 devices shipped during this time period, 15,444 devices were returned, a 7.4% return rate. You have not analyzed and trended this information to identify existing and potential causes of nonconforming products.
   - A review of your in-process Non-Conforming Material Report database from September 30, 2007, to October 1, 2008, revealed 5,531 in-process non-conformances. You have not analyzed and trended these non-conformances to identify existing and potential causes of nonconforming products.

The expectation is that if your product is not performing well, you need to trend and analyze the cause and fix it.

Where do the requirements for quality data and trending come from? *Indications from warning letters*

WL 6 January 2009 *(continued)*

2. Failure of your CAPA procedure to address the analyses of quality data to identify existing and potential causes of nonconforming products and other quality problems, as required by 21 C.F.R. § 820.100(a)(1).
   - For example, your CAPA procedure does not describe what quality data will be trended, how and how often this data will be trended and analyzed, and what statistical methodology will be employed to detect recurring quality problems.
   - We have reviewed your response, which states that you developed a new Data Analysis procedure for trending nonconformances and other quality data and are trending this data monthly. We cannot determine whether this response is adequate without documentation. Please provide an example of your monthly trend data and copies of any CAPAs that you generated as a result of your review of this trending.

Again you need a list of your quality data to trend and document the CAPA or other reaction to a trend.

Where do the requirements for quality data and trending come from?

Indications from warning letters

WL 10 September 2008

Failure to adequately establish and maintain procedures for implementing corrective and preventive action by failing to adequately analyze processes, … of quality data to identify existing and potential causes of nonconforming product, or other quality problems, and failing to utilize appropriate statistical methodology to detect recurring quality problems, as required by 21 CFR 820.100(a)(1).

> For example, 'Company' only analyzes telephone service requests from German companies . There is no analysis of other quality data such as telephone service requests from other countries, faxes or emailed service requests. Furthermore, the statistical methodology utilized to analyze the German telephone service reports was not adequate in that the data was not stratified by device type or year of production in order to provide the necessary evidence to support the conclusion that the XCT 900 component failures were due to old parts.

Your trending must cover your entire market scope and it has to be specific enough to be useful

Where do the requirements for quality data and trending come from?

Indications from warning letters

WL 12 May 2009

Failure to establish and maintain procedures for implementing corrective and preventive action, as required by 21 CFR 820.100(a). [Reference : Form FDA 483, Observation 1 and 2(a)-(f)]

> Specifically, your written procedures do not address data collection, such as identifying what data will be collected and the frequency of data collection and analysis to identify existing and potential causes of nonconforming product, or other quality problems. Per 21 CFR 820.100(a)(1), you must use appropriate statistical methodology where necessary to detect recurring quality problems; and, 21 CFR 820.250 requires you to establish and maintain procedures for identifying valid statistical techniques . Furthermore, your firm documented receiving at

Where do the requirements for quality data and trending come from?

Indications from warning letters

WL 12 May 2009 *(continued)*

> least *(redacted)* complaints between January 16, 2007 and April 15, 2008, involving Intraocular Gas Canisters failing to contain gas . Associated complaint records do not document a trend analysis was conducted . We reviewed your responses to these observations and concluded they are inadequate . We disagree with your assertion it is impossible to conduct a trend analysis based on the limited number of complaints received . A trend analysis is an essential aspect of risk assessment and is not limited to findings which are statistically significant . Further, the procedures you submitted to support your responses are the same procedures reviewed and collected during the inspection which were found to be inadequate.

You must identify the data you will collect, perform analysis and document it, statistical analysis is not the only type of trending expected.

Where do the requirements for quality data and trending come from?

Indications from warning letters

WL 14 April 2008

1. Failure to implement your corrective and preventive procedures to assure the sources of quality data are analyzed to identify existing and potential causes of nonconforming product or other quality problems . [21 C .F.R. § 820 .100(a)] Specifically,
    a. failure to analyze internal failures, supplier issues/audits, and complaints to identify trends and determine if a failure investigation was needed, as required by your Corrective and Preventive Action procedure.
    b. the following three trends in quality data sources were not identified and Form 54826 (Action Request Form) has not been initiated to investigate these trends

Where do the requirements for quality data and trending come from?

Indications from warning letters

WL 14 April 2008 *(continued)*

i. A total of 467 of the medical devices (garments and vests) manufactured between 11/5/2007 and 2/6/2008 required internal rework . These reworks have not been trended, no investigation has been performed, and no corrective action has been taken.

ii. A total of 36 of the 210 complaints on the Glove to Wrist device (item 59110535) were returned due to the wrong product being shipped. This trend was not identified, no investigation was performed, an d no corrective action was taken.

iii. A total of seven of the last 20 (the main components to all your devices) failed specification. This nonconformance was not investigated.

Similar to audits, if the FDA can find a trend they expect you to have found it first.

Where do the requirements for quality data and trending come from?

Indications from warning letters

WL 14 April 2008 *(continued)*

2. Failure to document corrective and preventive action activities, including analysis of sources of quality data, investigations of causes of nonconformities, the actions needed to correct and prevent the recurrence of nonconforming product and other quality problems, implementation of corrective and preventive actions, and dissemination of information about quality problems or non-conforming product to responsible parties. [21 C.F.R. § 820.100(b)].

   Specifically, your operations manager and systems manager stated that you are actively seeking and testing material from other potential suppliers of the fabric used to make your devices due to

Where do the requirements for quality data and trending come from?

Indications from warning letters

WL 14 April 2008 *(continued)*

> incoming fabric failures. Your Corrective and Preventive Action procedure was not followed, in that the Action Request Form (Form 54826) was not completed to document the investigation into these fabric failures and the evaluation of new suppliers . The only documentation for these actions is e-mails and tests results received from potential suppliers.
>
> You need a formal system to document identified trends and you need to follow it.

Where do the requirements for quality data and trending come from?

Indications from warning letters

WL 7 January 2009

3. You failed to establish and maintain procedures for implementing corrective and preventative action (CAPA), as required by 21 CFR 820.100(a).

   For example, your CAPA procedures address the operations of (redacted) a contractor. Those procedures instruct your management to evaluate your Corrective Action Request (CAR) log monthly. This procedure does not address evaluating data from returned merchandise authorizations, service reports, and other sources. Furthermore, you failed to implement the procedure in that you did not document review of your CAR log.

   If you don't document it, it did not happen.

Where do the requirements for quality data and trending come from? *Indications from warning letters*

- **WL 3/22/11**

- 1. Failure to establish adequate procedures for corrective and preventive action per 21 C.F.R. § 820.100(a).
  - Specifically, your firm's corrective and preventative action procedure, SOP #820.100 "Corrective & Preventative Action Procedure (CAPA)," does not identify all data sources which should be analyzed for the identification of potential causes of non-conforming product such as customer complaints, returned product, and incoming inspection reports. Your CAPA procedure only includes management reviews and internal quality audits as the two sources of quality data. Your firm has never conducted an internal quality audit, and has only had two management reviews since 5/15/2007. In addition, your firm has never conducted any analysis of data, such as trending, across different sources of quality data, such as complaints, returned product, incoming inspection results, etc.

This it a nice recent recap of what is expected, Identify data sources, and execute the reviews you say you will, trending across all the available quality data.

What are the requirements for quality data and trending?

From the previous slides we can see the requirements include the following:

1. List of quality data sources
2. All this data needs to be scrutinized on a routine and established basis
3. Statistical methodology needs to be used to evaluate. You have to establish set ways to analyze your data
4. You need to demonstrate that you are evaluating the data for trends

What are the requirements for quality data and trending?

From the previous slides we can see the requirements include the following:

5. You need to have all this effort established in a procedure
6. The types of data that should be in these data sources
7. Since most likely this data is housed in Computer Databases those will need to be validated

What are the requirements for quality data and trending?

List of quality data sources

- List of quality data sources. Some of the various data repositories include complaints, CAPA, nonconforming product, process control data, etc.
- This needs to be capture-able in a real list and as part of this list you need to include the reasons you would trend this specific data
- Your quality data must look both at your quality system, and specifically at how your individual products are performing
- A tool you can use to come up with a list of what your data sources are, would be to talk with those folks in your organization that routinely solve problems
- One of the things you can do to help your efforts is to consolidate the number of data repositories wherever possible

List of Quality Data Sources

From the QSR your list as a minimum should include:

- analyzing processes
- work operations,
- concessions,
- quality audit reports,
- quality records,
- service records,
- complaints,
- returned product,
- and other sources of quality data

List of Quality Data Sources

You should also consult the list of quality data sources cited in the GHTF Quality management system–Medical Devices: Guidance on corrective action and preventive action and related QMS processes, dated 22 September 2009.

Examples of data sources can be, but are not restricted to:

- Supplier
- Performance / controls
- Complaint handling
- Adverse event reporting

List of Quality Data Sources

Examples of data sources can be, but are not restricted to *(continued):*

- Process controls
- Finished product
- Quality audits (internal/external)
- Product recall
- Spare parts usage
- Service reports
- Returned product

List of Quality Data Sources

Examples of data sources can be, but are not restricted to *(continued):*

- Market / customer surveys
- Literature
- Management review
- Product realization (design, purchasing, production and service and customer information)

The GHTF Appendix A is more exhaustive.

What are the requirements for quality data and trending?

All this data needs to be scrutinized on a routine and established basis

- All this data needs to be scrutinized on a routine basis. The requirement is that your trending is capable of identifying issues so that you can identify existing, potential or recurring issues.
- The frequency of refreshing your data really needs to fit your organizations processes.
- You need to be looking within your data silos, but also across them to more fully extract useful information and help identify and solve your issues.

What are the requirements for quality data and trending?

- You have to be able to demonstrate that not only are you doing trending but you are doing something with it.
  - You could employ a log sheet to document each identified trend and a list of the reaction: CAPA, investigation, document change, specification update, etc.

What are the requirements for quality data and trending?

Statistical methodology needs to be used to evaluate. You have to establish set ways to analyze your data

- Statistical methodology should be used where appropriate. You have to establish set ways to analyze your data. Some examples are:
  - SPC methodology, X bar and R charting, SPC rules are generally accepted but understand they are based on a +/-3 sigma range of acceptable occurrences. That means that all things being equal you will only see a trend ~.0026% of the time for each metric.
  - Self derived statistical rules. If you use these you need to have a sound statistical explanation.
  - Visual charting

  Remember while the regulation particularly indicates statistical methods; from the warning letters and the GHFT non-statistical trending methods cannot be ruled out.

Trending Methods

The GHTF identifies the following as appropriate trending tools. For the analysis of nonconformity, appropriate statistical and non-statistical techniques can be applied.

- Statistical techniques are for example:
  - Statistical Process Control (SPC) charts
  - Pareto analysis
  - Data trending
  - Linear and non-linear regression analysis
  - Experimental design (DOE – Design of Experiments) and analysis of variance
  - Graphical methods (histograms, scatter plots, etc.)

Trending Methods *(continued)*

- Non-statistical techniques are for example:
  - Management reviews
  - Results from quality meetings
  - Safety committees (internal or external)
  - Failure Mode and Effect Analysis (FMEA)
  - Fault Tree Analysis (FTA)

What are the requirements for quality data and trending?

You need to demonstrate that you are evaluating the data for trends.

- You need to demonstrate that you are evaluating the data for trends, at the very least during management review but likely more frequently.
  - Your efforts must be documented or they do not exist
  - The frequency needs to be such that you can catch an issue in a timely manor
  - The FDA expects to see results from your trending efforts, including seeing that they can be escalated into a CAPA if necessary

What are the requirements for quality data and trending?

You need to have all this effort established in a procedure

- You need to have all this effort established in a procedure.
  - In the procedure you should list the data to be trended (Quality Data list) and why you are trending this particular metric
  - The frequency of trending: monthly, quarterly, etc.
  - Methods of trending you are going to use: when to use statistical tools and when to use non-statistical.
  - How you document identified trends
  - What your reactions to your trending efforts are going to be

You need to have all this effort established in a procedure

- What constitutes a trend?
  - Generally you would define the trending rules your organization will use. The Key is you have someone who understands those rules and can describe the statistical justification.
  - If the average is much less than one, then one could be a trend statistically, but really this is an incident

Skill Sets Required for Trending

- The training for quality data analysis does not have to be extensive, but they have to understand the statistics behind the rules they are working with.
- Most work is fairly straightforward spreadsheet applications. Nothing more complex that average, standard deviation, conditional counting, and conditional formatting
- Extraction of metrics sets from a database are usually repetitive exercises.

What are the requirements for quality data and trending?

What types of data should be in these data sources

- What types of data should be in these data sources. Some minimum requirements include: what is the product, name and part numbers if appropriate, Batch or other unique identification used uniformly throughout your process, the date an issue started, some sort of description of the problem.
- The more detailed information you have in each part of your quality data system the easier it will be to match that information across these systems and hopefully then be able to more quickly identify the root cause and solutions to quality issues.

What types of data should be in these data sources

- It should be noted that throughout the regulations there are specific requirements for the types of data you maintain, for instance for complaints you need:
  - name of device
  - date of the complaint
  - device identifications and control numbers used
  - name address and phone number of the complainant
  - the nature and details of the complaint
  - dates and results of the investigation
  - any corrective action taken
  - and any reply to the complaint

What are the requirements for quality data and trending?

- Since most likely this data is housed in computer databases, they need to be validated.
  - WL 2/25/10 -- 3. Failure to validate computer software for its intended use according to an established protocol when computers or automated data processing systems are used as part of production or the quality system, as required by 21 C.F.R. §820.70(i) (Production and Process Controls - Automated Processes). For example, the CAPA analysis of non-conformances, which is used at management meetings, is inadequate in that the report is computer-generated on a non-validated software system.
    - We have reviewed your response and have concluded that it is inadequate because you state that you have eliminated the electronic recordkeeping for CAPA. but you have not provided evidence of an adequate recordkeeping system to replace the electronic system.
- The people with access to the data will need to be controlled and updated periodically.

Examples for Quality Data and Trending Tools

Examples of trending tools and data analysis:

- Monthly dashboards, scorecards
- Management reviews
- Specific issue deep dives and cross data source searches

Monthly Dashboards, Scorecards

Here you list your quality data categories and input your metrics: the monthly totals, cycle times, late events, cause coding for: CAPAs, Complaints, MDRs, Returned product, etc.

But for each of your categories you should also be trending by your specific products to try and catch issues as they develop and look for recurrences.

You need to utilize as many non-redundant quality data sources as you have available to you.

Metric system	Quality System metrics	Product performance/ numbers or percents of adverse events	Cause performances, number or percent of the top causes of non-conformances
Analyzing processes			
Work operations			
Concessions			
Quality audit reports			
Quality records			
Service records			
Complaints			
Returned product			

Monthly Dashboards, Scorecards *(continued)*

Usually you will be comparing these metrics against some sort of statistical/historical model of performance, or some agreed to goal.

In larger more complex organizations you it may make sense to have product or business area specific dashboard tailored to the information for that area and have a more generic dashboard for the higher level organization.

Monthly Dashboards, Scorecards *(continued)*

One of the most difficult issues is: how do you condense potentially literally thousands of lines of metrics into an understandable and viewable list for senior management to react to.

- Have a two level dashboard where you have a full list of metrics trended, but also have an aggregated score presented in an executive summary
- You would separate out your quality system type metrics from your product and cause specific metrics.

Quality Dashboard **Operational Quality Detail Sheet**

Quality Objective	Category	Metric	Owner	2008 YTD	Monthly average	Current March	Percent to Target	YTD to Target	2008 Target
Comply with worldwide regulatory requirements	FDA Compliance	Warning Letters	FDA news	0.0	0.0	0.0	0.0%	same	0.0
		Investigational form 483 Observations	FDA news	0.0	0.0	0.0	-100.0%	same	0.2
	Overall Compliance	Major or Critical risk Audit CAPAs	FDA news	0.3	0.0	1.0	-100.0%	better	0.7
Enhance quality through effective processes	Non Conforming Materials metrics	Number of NC ytd	S Claus	24	22.0	0	-15.8%	same	26.1
		NC cases with greater than 90 Day cycle times	S Claus	2	6.0	-1	-4.0%	better	6.3
		Percent CAPAs	S Claus	0	34.0%	50.0%	-17.5%	better	41.2%
		Cycle times	S Claus	17	6	-1	-89.0%	better	58.4
		Proposed Disposition - Rework	S Claus	2	1.0	0	-71.4%	better	3.5
	Process Deviations	Temporary Deviations	JEM	16.3	13.0	0.7	35.1%	worse	9.63
		Out of Specification Investigations	JEM	18.3	18.0	-0.3	-33.8%	better	27.2
	Corrective Actions	All CAPA	FDA news	3	2.0	-1	-87.8%	better	16.4
		CAPA cycle time, days	FDA news	260	295.0	1	72.7%	worse	170.8
		Deviation Type CAPAs	FDA news	1	1.0	-1	-91.9%	better	12.3
		Complaint CAPAs	FDA news	1	1.0	-1	-60.0%	better	2.5
		CAPA Queue	FDA news	71	56.0	0	-56.1%	better	127.6
		Case extensions	FDA news	3	2.0	**0**	-25.9%	same	2.7
		Overdue CAPA tasks	FDA news	6	13.0	0	71.4%	better	7.6

Quality Dashboard	Customer Quality Detail sheet		Return to Executive Summary						
Quality objective	**Category**	**Metric**	**Owner**	**2008 YTD**	**Monthly average**	**Current month**	**2008 to Target**	**YTD to Target**	**2008 Target**
Serve Customer Expectations	Local Products Complaints (global)	Site made products with complaints	T Fairy	923	300.8	280	20.8%	worse	248.92
	Escalated Complaints	Complaint Queue	T Fairy	na	56.0	47	9.8%	same	51.00
		New Complaints/Inquiries	T Fairy	172	55.0	48	8.9%	same	50.5
		Processed in greater than 30 days,	T Fairy	34	16.0	4	2.7%	same	15.6
		Complaint Cycle time average	T Fairy	na	29	11	1.6%	same	28.54
		Percent Complaints	T Fairy	na	50.0	34	-30.5%	better	45.0
	Top replacement kits	**Product Description**	Monitor	butter	gerpack	instrument 6	bag of pc	becker	workbook
		Product Number	Monitor	956757	8567b b	8507500-	35654	68r6y456	3y65768d
		Number of replacements March	Monitor	23	21	19	17	17	13
	Investigated Product Complaints	pMDRs % of IU investigations	S Claus	na	13.1%	5.0%	52.1%	worse	8.61%
		Cases open longer than 30 Days	S Claus	50	15.5	13	31.0%	worse	11.8
		Investigations	S Claus	61	20.0	25	14.8%	same	17.4
		Investigation time (investigation to customer close average time)	S Claus	na	8.6	6	-6.2%	same	9.1
		Product Bulletins	S Claus	4	1.8	3	50.0%	worse	1.2
	Investigative unit Responsible Top Five Cause Codes	Accuracy	S Claus	2	0.8	0	-75.7%	better	3.1
		Sample Accuracy	S Claus	6	1.5	0	5.9%	same	1.4
		Stability	S Claus	0	0.0	0	-100.0%	better	1.8
		Contents Damaged Item	S Claus	2	1.5	0	80.0%	worse	0.8
		Labels Incorrect	S Claus	4	1.0	0	100.0%	worse	0.5

FDAnews Quality Dashboard				Overall score	27
Quality Objective	**Category**	**Stoplight, 2008 Year**	**Trends month to YTD**	**Stoplight, March 2008**	**Significant Issues**
Serve Customer Expectations	**Product Complaints**	same	better	better	
	Complaint Investigation unit	worse	worse	worse	**Large influx of new cases**
Comply with worldwide regulatory requirements	**FDA Compliance**	same	worse	better	**One audit finding**
Enhance quality through effective processes	**Nonconforming Material**	better	better	better	
	CAPA System	better	better	better	

Trending By Cause and Material incidents for each DATA source

- As part of your trending you will need to look into both how your specific materials and the different causes/reasons are behaving in each of your Quality Data systems.
- There really is no substitute for looking at (trending) each and every material every time (monthly, quarterly, weekly, etc)
- However, Management would be interested in those products or causes that seem to have gotten worse. So there are a wide range of tools available. Exponential curve statistical rules, P or C or other discrete distribution based SPC tools, etc.

Material	Sum of last three months	average	Exponential (97% factor)	January-08	February-08	March-08	April-08	May-08	June-08	July-08	August-08
11986028216	9	1.25	4.38	0	0	1	0	0	0	0	9
11929640216	8	1.38	4.81	0	3	0	0	0	0	8	0
2118292190	7	0.88	3.06	0	0	0	0	0	7	0	0
2421102160	2	0.75	2.63	0	1	0	3	0	2	0	0
2041441160	2	0.25	0.88	0	0	0	0	0	1	0	1
2421248160	1	0.38	1.31	1	0	0	1	0	0	0	1
11111291122	1	0.38	1.31	1	0	1	0	0	0	1	0
20164841122	1	0.13	0.44	0	0	0	0	0	0	1	0
20164910122	1	0.13	0.44	0	0	0	0	0	1	0	0
11821298122	1	0.13	0.44	0	0	0	0	0	0	1	0
4628918190	1	0.13	0.44	0	0	0	0	0	1	0	0
11111412122	0	0.71	2.50	0	0	0	0	5	0	0	t
12142181122	0	0.25	0.88	0	0	0	1	1	0	0	0
20164622122	0	0.25	0.88	0	2	0	0	0	0	0	0
11116061122	0	0.13	0.44	0	0	1	0	0	0	0	0
2094198160	0	0.13	0.44	1	0	0	0	0	0	0	0
21042644001	0	0.13	0.44	0	1	0	0	0	0	0	0
2094810160	0	0.13	0.44	0	1	0	0	0	0	0	0
11111429122	0	0.13	0.44	1	0	0	0	0	0	0	0
11226209216	0	0.13	0.44	0	0	0	1	0	0	0	0
11098982122	0	0.13	0.44	0	1	0	0	0	0	0	0
11820196122	0	0.13	0.44	1	0	0	0	0	0	0	0

Trending of Causes

Complaint Cause	Sum of last three months	Average	Exponential (97% factor)	February-10	March-10	April-10	May-10	June-10	July-10	August-10
Labels Incorrect	91	17	40	13	49	20	16	14	40	37
Electronic Failure	48	15	23	29	16	17	16	8	24	26
Mechanical Failure	42	11	19	14	19	6	10	7	21	14
Labels Damaged	40	7	15	11	16	38	16	7	20	13
Reagent Accuracy	38	8	18.	6	7	2	3	6	22	10
Control Accuracy	32	6.42	14.79	5	6	1	1	4	17	11
Calibrator Accuracy	24	5.28	12.16	5	5	1	2	1	17	6
Sample Accuracy	14	4.14	9.53	0	1	12	2	1	10	3
Software Failure	13	3	5	2	2	5	2	4	6	5

Examples for Quality data and trending tools

- Management Reviews
  - The data for management reviews should be an overall picture of your quality systems health with specific attention being brought to any active issues identified in your trending.
  - Because it is possible to swamp management with the numerous metrics possible, one can prioritize and publicly present those issues of most importance and the metrics that are under control can be relegated to backup data to be looked at outside the meeting.
  - For system coherence you should be presenting the same metrics sets in your dashboards as at the Management Reviews, it is very easy to proliferate.

Specific issue deep dives and cross data source searches

- For deep dive searches to succeed you need to have good traceability at each production and process step. From the external contact you have to ask for the specific identification of the product.
- This may sound obvious but in practice it requires that you intentionally design this type of information into each step of your data systems.
- As you start doing these types of investigations the quality of your data systems can make the investigation much easier.

Specific issue deep dives and cross data source searches

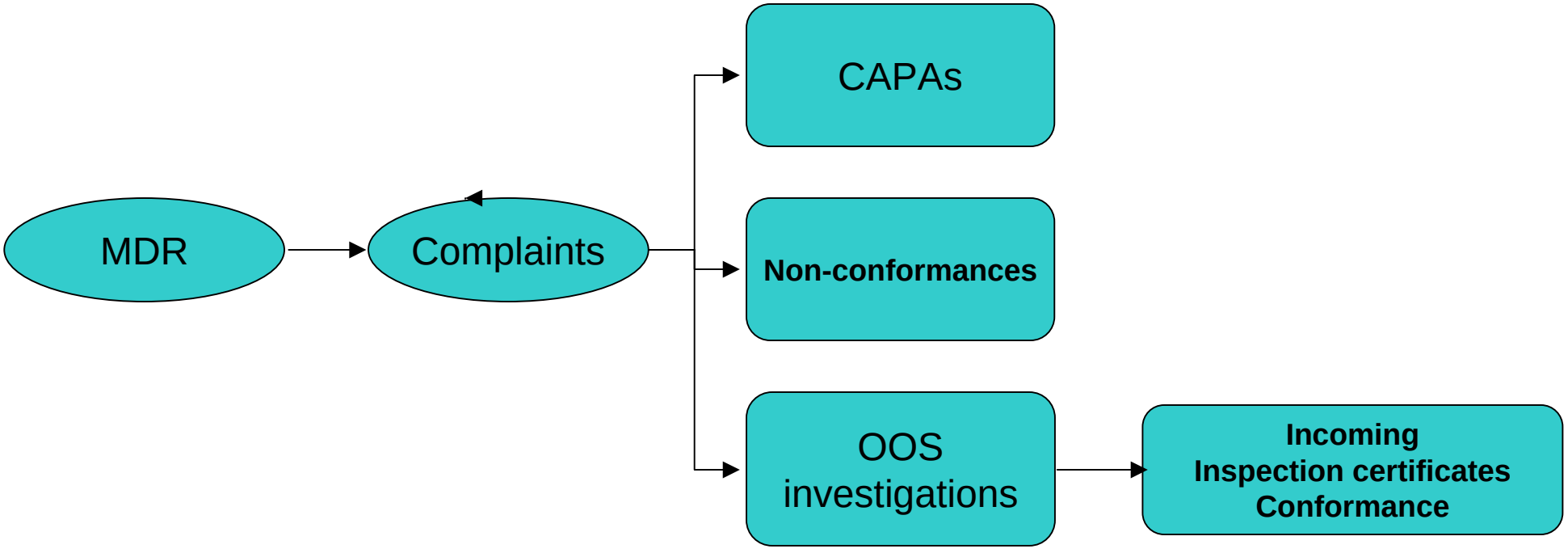
The statistical tools sited in the GHTF document:

- Linear and non-linear regression analysis
- Experimental design (DOE – Design of Experiments) and analysis of variance.

Can become very powerful if your system includes some of the variables type performance data.

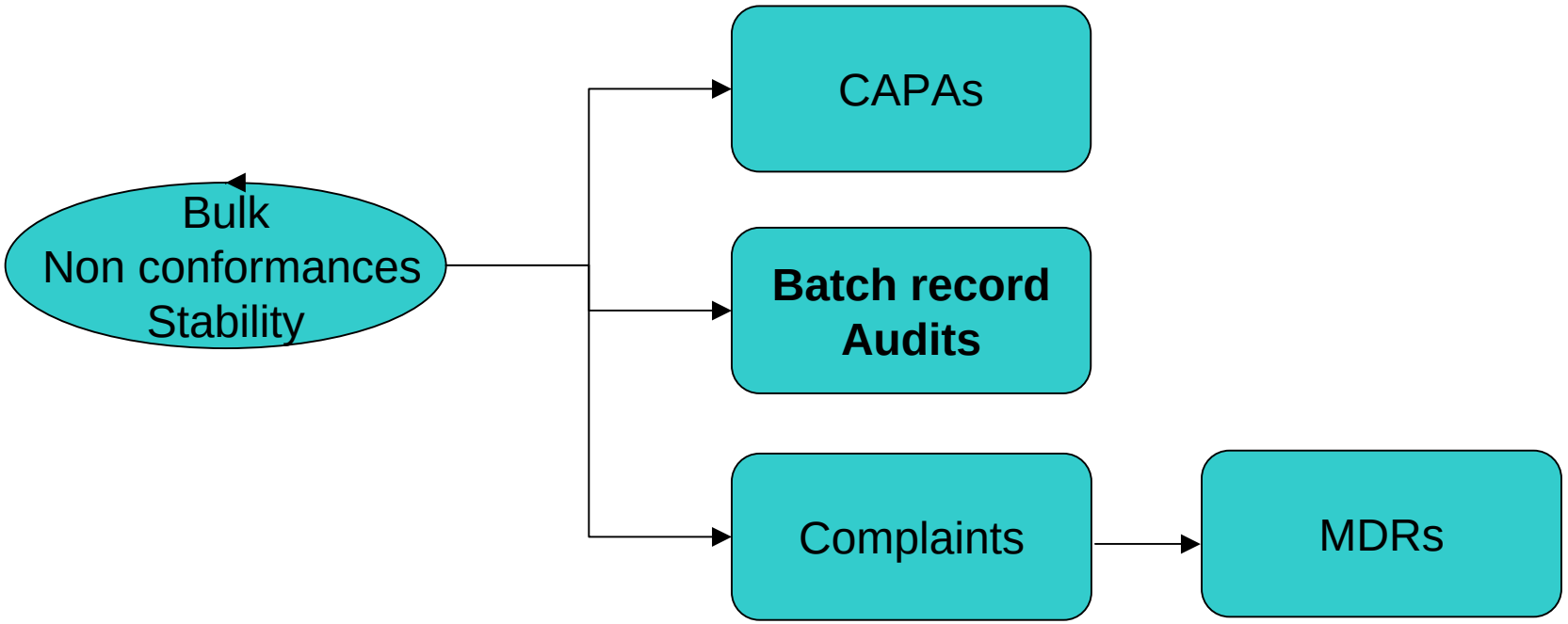
Examples for quality data and trending tools, specific issue deep dives and cross data source searches

Here is an example of a backward look from a MDR back to the incoming inspection certificate of conformance



Examples for quality data and trending tools, specific issue deep dives and cross data source searches

Here is an example of a forward look from a nonconforming material trend out to customer complaints.



Specific issue deep dives and cross data source searches

Ultimately the theoretical and practical reasons for the quality data and trending requirements become clear. If you have a thorough quality data system your root cause investigations can be done quicker and with greater confidence. The more you know of your product’s history and performance the greater clarity it brings to the initial investigation.

FDAnews: QSR Quality Data and Trending Requirements

What we have covered

Where do the requirements come from?

- Explicit requirements from the QSR
- Implicit requirements from the QSR
- Implied requirements from Warning letters
- GHTF: Quality Management System–Medical Devices: Guidance on corrective action and preventive action

FDAnews: QSR Quality Data and Trending Requirements

What we have covered

- What are the requirements
  - List of data sources
  - All sources scrutinized
  - Use of statistical and non-statistical tools
  - Demonstrate actionable trending
  - Quality data systems must be established
  - Data system control, content and validation

FDAnews: QSR Quality Data and Trending Requirements

What we have covered

Examples of trending tools and data analysis

- Monthly Dashboards, Scorecards and skill sets to create them
- Management Reviews
- Specific issue deep dives and cross data source searches

Additional Resources

- Global Harmonization Task Force Quality management system–Medical Devices: Guidance on corrective action and preventive action and related QMS processes, Dated 4 November 2010, http://www.ghtf.org/documents/sg3/sg3_n18.pdf
- FDA warning letter listings: http://www.fda.gov/ICECI/EnforcementActions/WarningLetters/default.htm
- QSIT manual: http://www.fda.gov/downloads/ICECI/Inspections/InspectionGuides/UCM085938.pdf
- QSR part 820: http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=820&showFR=1

Questions?

Thank you!

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Partial Warning letter listing 2010-2011

- 26-Apr-10 Accurate Set Inc.
- 1-Dec-10 advanced Surgical Design & Manufacture, Ltd.
- 8-Nov-10 Anchor Products Company, Inc
- 16-Feb-10 Biological Controls
- 13-Jul-10 Cincinnati Sub-Zero Products Inc
- 12-Jul-10 Circulatory Technology Inc
- 10-Mar-10 Clearwater Products, LLC
- 1-Sep-10 Cortechs Labs Inc
- 21-Jun-10 Cranial Solutions
- 30-Sep-10 Impact Instrumentation, Inc.
- 15-Dec-10 Invacare Corporation
- 11-May-10 Molteno Ophthalmic Ltd
- 25-Feb-10 Olympus Temmo Biomaterials Corporation - Mishima Factory
- 30-Nov-10 OsteoSymbionics LLC
- 21-Sep-10 Perma Pure LLC
- 14-Jan-10 Premium Dental, LLC
- 24-May-10 Syntron Bioresearch Inc
- 11-Mar-10 Talisman Limited
- 20-Aug-10 The Standing Company
- 18-Feb-11 Tytan Medical, Corp.
- 18-Jan-11 Tosoh Biosciences, Inc.
- 7-Feb-11 Southern Implants, (Pty.) Ltd.
- 6-Apr-11 Sometech Incorporated
- 3-Feb-01 OEM Systems Co., Ltd.
- 24-Jan-11 Lynn Peavey Co
- 14-Mar-11 Health Robotics Srl
- 22-Mar-11 DiaPharma Group Inc
- 25-Feb-11 Cenova Innovation and Productions AB
- 18-Mar-11 Caridian BCT Inc

What is a FDA Warning letter?

- When FDA does it's site inspections either: routine, or for cause, it has an escalating series of responses.
  - None
  - Verbal observation
  - Form 483 written observations which must be responded to.
  - Warning letter which can lead to consent decree for extra ordinary actions or the following further actions.
  - Product confiscation or destruction order
  - Prohibition of business in the US
- The Warning letters are posted on the FDA's web site.