**Nonconforming Events: Identification, Control, Action, Documentation and Referral for LC-MSMS Laboratory Developed Tests (LDT), Standard Operating Procedure (SOP) Template**

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**Code of Federal Regulations 820.90 Nonconforming product**

(a) ***Control of nonconforming product.*** Each manufacturer shall establish and maintain procedures to control product that does not conform to specified requirements. The procedures shall address the identification, documentation, evaluation, segregation, and disposition of nonconforming product. The evaluation of nonconformance shall include a determination of the need for an investigation and notification of the persons or organizations responsible for the nonconformance. The evaluation and any investigation shall be documented.

(b) ***Nonconformity review and disposition.***

(1) Each manufacturer shall establish and maintain procedures that define the responsibility for review and the authority for the disposition of nonconforming product. The procedures shall set forth the review and disposition process. Disposition of nonconforming product shall be documented. Documentation shall include the justification for use of nonconforming product and the signature of the individual(s) authorizing the use.

(2) Each manufacturer shall establish and maintain procedures for rework, to include retesting and reevaluation of the nonconforming product after rework, to ensure that the product meets its current approved specifications. Rework and reevaluation activities, including a determination of any adverse effect from the rework upon the product, shall be documented in the DHR (device history record).

**Code of Federal Regulations 820.184 Device history record.**

Each manufacturer shall maintain device history records (DHR's). Each manufacturer shall establish and maintain procedures to ensure that DHR's for each batch, lot, or unit are maintained to demonstrate that the device is manufactured in accordance with the DMR and the requirements of this part. The DHR shall include, or refer to the location of, the following information:

(a) The dates of manufacture;

(b) The quantity manufactured;

(c) The quantity released for distribution;

(d) The acceptance records which demonstrate the device is manufactured in accordance with the DMR;

(e) The primary identification label and labeling used for each production unit; and

(f) Any unique device identifier (UDI) or universal product code (UPC), and any other device identification(s) and control number(s) used

**I. PURPOSE (CFR 820.90 [a,b])**

This procedure describes how nonconforming products and events (NCE) related to LC-MSMS testing are defined and identified to maintain highest quality LDT. Also included are protocols for documentation, evaluation, control (segregating, marking as out-of-service, evaluating, discarding, returning to vendors, maintaining, repairing, tracking) as well as retesting of the original or a newly prepared, maintained, purchased, or serviced “product”, “event”, or instrument. If LC-MSMS LDT results using NCE have been reported for patient care or occur with unacceptable frequency, the NCE are referred to the LDT Complaints and Nonconforming Events Quality Assurance (LDT-QA) Committee for review, corrective, and preventative action, including investigation and Medical Device Reporting if necessary. The preliminary evaluation performed within 24 hrs when harm, serious injury or death of a patient could be related to LC-MSMS LDT NCE is described. See also the LDT-QA Committee Actions and Medical Device Reporting SOPs. See section III. Definitions, for a list of the LC-MSMS LDT performed by this laboratory, the definition and responsibilities of the LDT-QA Committee and the FDA definition of serious injury.

**Fig 1. FDA Diagram of Complaints, Nonconforming Event Relationship to Corrective Action/Reporting**



**II. SCOPE (CFR 820.90 [a,b])**

This SOP and associated forms apply to all LC-MSMS laboratory section personnel and instruments. For the purpose of compliance with FDA regulations for IVD, including LDT, the definitions of “products” or “events” are interpreted broadly, including but not limited to: pre-, post- and analytical testing processes; selected verification/validation test outcomes for products and instruments; instrument/equipment functions; purchased or prepared LC-MSMS reagents, chemicals, mobile phases, consumables, chromatography supplies, containers (mobile phase bottles, vials, plates, septa, caps, plate seals); sample preparation media; middleware; instrument software, hardware, and replacement parts.

**III. DEFINITIONS**

**III.1 List of LC-MSMS LDT performed by this laboratory:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Date LDT in use for Patient Care** | **LC-MSMS LDT Name Displayed in EMR (e.g.Epic)** | **LIS mnemonic(s) & FDA LDT Product Code** | **LC-MSMS LDT Method SOP name** |
| 1. | 7/4/14 | Opiates Confirmation, Urine | OPCFM & SCE | Urine Opiates Confirmation by LC-MSMS |
| 2. | 9/07/24 | Testosterone, Female  | TSTOMS & SCF | Testosterone by LC-MSMS |

**III.2 LDT-QA Committee for Review, Action, and Reporting on LC-MSMS LDT Complaints and Non-Conforming Events (CNCE) (CFR 820.90 [b]; 820.100 [Corrective & Preventative Action])**

The LDT-QA committee is the formally designated unit with responsibility to ensure there is evaluation, documentation, review, control (segregation, disposal), and investigation if appropriate, and as necessary, corrections, preventative action, removal, internal reporting, and Medical Device Reporting (MDR) to the FDA for CNCE related to LC-MSMS LDTs (CFR 820.90[a], 802.100, 820.198[b]). The LDT-QA committee has scheduled meetings (define interval – weekly, monthly). If preliminary evaluation suggests that death or serious injury to a patient may be related to an LC-MSMS LDT result failure, the committee will meet ad hoc within 48 hrs of receiving the CNCE referral. See section III.3 below for the FDA definition of serious injury to a patient. For a complete description of the LDT-QA Committee responsibilities see the LDT-QA Committee, Actions and Medical Device Reporting SOPs. Review and investigations of CNCE must be conducted by the LDT-QA Committee in a timely and uniform manner. Current committee members are:

**III.2.1** The LC-MSMS LDT section supervisor, name & job title (indicate if Committee Chair),

**III.2.2** The LC-MSMS LDT section Director/designate, name & job title (indicate if Committee Chair),

**III.2.3** The laboratory QA Director/designate, name & job title. The FDA requires that this committee member cannot work in the LC-MSMS laboratory section OR report to the LC-MSMS supervisor or Director,

**III.2.4** If applicable, the individual responsible for LC-MSMS test method development and validation oversight, name & job title.

**III.3 Serious injury as defined by the FDA is:**

**III.3.1** Life threatening; or,

**IIII.3.2** Results in permanent impairment or damage to a body function or structure; or,

**III.3.3** Requires medical or surgical intervention to preclude permanent impairment or damage to a body function or structure.

**III.4 Unique Device Identifier (UDI) and FDA Product Codes for LDTs (CFR 820.198 d,3)**

A UDI is the unambiguous, number identification of an LC-MSMS LDT required for reporting test problems to the FDA (see SOP for Medical Device [MDR], Corrections and Removals Reporting). UDIs are assigned by an FDA-accredited issuing agency. Product codes are the FDA’s method of classifying and tracking medical devices. They are assigned and maintained by the FDA and required for Medical Device Reporting.

**FDA** **Product Codes for LDTs** (partial listing) are:

1. **SCE** - IVD offered as LDT, first marketed before May 6, 2024, not modified beyond scope described in preamble to LDT Final Rule

2. **SCF** - LDT, unmet need within an integrated healthcare system

3. **SCG** - Modified version of another manufacturer’s FDA-authorized test within scope described in preamble to LDT Final Rule

4. **SCH -** LDT, approved by NYS CLEP

5. **SCJ** - LDT, NOT under a targeted enforcement discretion policy (see preamble to LDT Final Rule)

Consult the MDR SOP, individual method SOPs, and/or the LC-MSMS supervisor/designate to verify the correct UDI and Product Code for an LDT associated with a Complaint or NCE. The codes above may be replaced by device specific Product Codes in the future.

**III.5 Definition of the Batch Cover Sheet**

A batch cover sheet provides traceability of components used in each patient reportable LC-MSMS batch of specimens, by recording lot/serial numbers of blanks, calibrators, QC, instrument(s) used, batch related file names, analysts, reagents, other consumables, and provides a checklist/reminders/ for LC-MSMS data review and parameter recording [e.g. heat block temperature] (see attached MSACL-CAC\_ Batch Cover Sheet template).

**III.6 Definition of the Device History Record (DHR) for LC-MSMS LDT (CFR 820.184)**

The DHR for LC-MSMS LDTs consists of:

**III.5.1** For date ranges of test development, validation, and the go-live date for patient sample testing (820.184 [a,b]: see hard copy/online records for method development and validation data and approvals, LIS/EMR build records for patient care testing go-live dates,

**III.5.2** LIS records of samples tested for patient care after the go-live date (820.184 [c]),

**III.5.3** Method validation plan, validation raw and processed data records, validation summary with laboratory director approval signature and planned go-live date (820.184 [d]),

**III.5.4** SeeLC-MSMS LDT names and descriptions in each LC-MSMS LDT method SOP, in the LIS build for each LDT, in the EMR build for each LDT and in the online test directory build for each LDT (820.184 [e]),

**III.5.5** See Unique Device Identifiers (UDI) in method SOPs (see III.4 above)(820.184 [f]),

**IV. PROCEDURE: Identification, Documentation, Evaluation, Control (Segregation, Disposition), and Referral (for Investigation, Reporting) of NCE for LC-MSMS LDT (CFR 820.90 [a,b])**

**IV.1 Sources of and Actions for Nonconforming Product/Events (NCE) of LC-MSMS LDT by Testing Phase**

**Table 1. FDA Characterization of Nonconforming Events Related to Corrective Action/Device Phase**

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**IV.1.1** **Category 1: Pre-Analytical; Pre-use Tested LC-MSMS LDT Products/Instruments with Unacceptable Failure Frequency (“Manufacturing” pre-analytical phase; no patient care results reported)**

**IV.1.1.A IDENTIFICATION of Category 1 NCE (CFR 820.90 a,b)**

**IV.1.1.A.a Consumables** (product) used for LC-MSMS LDT may undergo validation testing before use for patient sample testing. Pre-use tested consumables may be classified as NCE when validation testing fails to meet specifications with unacceptable frequency as defined in the SOP see LDT Method SOPs and Between Lot Testing SOPs). As they are prepared or received, these materials are entered in the Product Database with status as untested new lots, “Not Available for Use”. New lots of consumables that will have validation testing before use are stored (segregated) in a separate location (different shelf, different refrigerator, different cabinet, different drawer) from validated, ready for use products and from products that failed pre-use validation testing. They are physically tagged as “Untested New Lot – Do Not Use”. Products that may have pre-use testing include in-house prepared or purchased mobile phases; chromatography supplies (inline filter, guard or pre-column, LC columns, mobile phase containers); reagents; calibrators; blank matrices; QC materials; chemicals; solvents; extraction media; vials/septa/caps and 96 well plates/seals used for LDT sample preparation or LC-MSMS analysis. Products that fail pre-use validation are not used for patient testing, unless the LC-MSMS supervisor authorizes retesting that is successful (see also LC-MSMS LDT Method SOPs, Between Lot Testing SOPs and records [Product Database}, Validation of LC Columns SOP and Column Log records, Product Database SOP).

**IV.1.1.A.b Supply Chain** If there is insufficient stock of pre-use validated products, ready to use for LC-MSMS LDT, this occurrence may be defined as NCE if supplies interruption occurs for any reason with unacceptable frequency (as defined in the SOP).

**IV.1.1.A.c LC-MSMS instruments** used for LDT have system suitability testing (SST event) performed daily before use for testing patient samples. When SST or any other indicator of instrument failure occurs, the LC-MSMS is labeled as “out of service” and not used for patient sample testing until review, maintenance, repair, or vendor service followed by repeated, successful SST has occurred (see LC-MSMS Operation SOP, LC-MSMS Maintenance SOP, instrument maintenance calendars, vendor maintenance, and service records). SST failure may be defined as NCE if it occurs with unacceptable frequency (as defined in the SOP).

**IV.1.1.B DOCUMENTATION, EVALUATION, SEGREGATION and DISPOSITION for Category 1 NCE**

If LC-MSMS LDT materials fail pre-use validation testing or an instrument fails pre-use SST, such product is not defined as NCE unless pre-use testing fails with unacceptable frequency as defined in the SOP. Whenever pre-use testing fails:

**a.** the LC-MSMS supervisor/designate is notified.

**b.** Consumable products are physically tagged as “Failed new lot testing” and separated in a different storage location from other new or in use product lots. Instruments are clearly designated as “not in use”.

**c.** Pre-use consumables or instruments with failed validation testing results are:

1. reviewed by the supervisor/delegate,
2. marked as failed in Between Lot testing records,
3. a status of “Failed Between Lot testing” is entered in the Product Database,
4. SST results are recorded in an SST log, marked as failed,
5. a notation of “Failed SST” is made on the instrument maintenance calendar.

**d.** The supervisor/designate reviews the details of preparation and validation testing for the failed lot and/or of daily instrument maintenance/SST/recent vendor service:

 i. The supervisor/designate queries the Product Database to evaluate any previous

 occurrences of pre-use validation testing or retesting failure for this product and/or

 reviews current and previous instrument maintenance calendars and vendor service

 records for frequency of SST failures, other problems noted, unscheduled mainte-

 nance or service.

 ii. If found, any previous pre-use testing or retesting failures or LC-MSMS instrument

problems are evaluated for frequency, common features or causes (e.g. prepared or

used by same person, recent change of a product lot or unscheduled instrument

maintenance).

 iii. The supervisor/designate may have a consumable retested or have instrument

 maintenance and/or SST repeated.

**e.** Based on the above, consumables may be discarded (see also Hazardous Waste SOP, records), returned to the vendor, or instruments may remain out of service until repaired. These outcomes are noted with a rationale in Between Lot testing records and the Product Database or on instrument maintenance calendars, signed and dated by the supervisor/ designate.

**f.** For purchased NCE products, the vendor is notified and if appropriate the product is disinfected if necessary and returned. As appropriate, the LC-MSMS supervisor/designate, laboratory director or the LDT-QA committee may request purchased product replacement, request an investigation of the NC product by the vendor or initiate a search for replacement product from another vendor.

**g.** If retesting or maintenance/repeat SST is successful, the supervisor enters the rationale and outcome for retesting in the Product Database or instrument maintenance calendar, with signature/date/time. Single or rare occurrences of these products/events are not necessarily defined as NCE as no patient sample results are reported using products with failed pre-use testing. See method/consumables SOPs for frequency failure specifications that define NCEs for each product/event.

**h.** If pre-use testing, retesting or SST failure occurs with unacceptable frequency (see individual LC-MSMS LDT method SOPs for acceptable frequency specifications), the problem is considered NCE and is evaluated and referred with an NCE Report to the LDT-QA Committee for review and investigation (see attached NCE Report Form template).

**IV.1.2 Category 2: Analytical/Post-Analytical Phases; Patient Results Reporting with Unacceptable Failure Frequency (“Manufacturing”, Analytical/Post-Analytical Phases; no patient results reported)** Manufacturing is defined for this analytical/post-analytical phase as product/testing/event failure that occurs after an LC-MSMS LDT result that is intended for patient care has been produced but prior to reporting the result for viewing by the ordering provider. LC-MSMS LDT patient sample results are not reported until the NCE event has been resolved.

Acceptance criteria (specifications) for IV.1.2.1A-C below (Calibration, QC, Metadata) should be in compliance with applicable published reference standards, such as CLSI C62, 2nd ed and others (CFR 820.70 [a][3]) (see LC-MSMS Method and Reagent/Calibrator/Chemical Materials/Mobile Phase Between Lot Testing SOPs for calibration design and frequency, in-house preparation or commercial supply of calibrators, calibrator stability, pre-use calibrator, blank matrix and QC between-lot testing and acceptance criteria, calibration acceptance criteria [CFR 820.70 {a},{1,2,3,4,5}]).

**IV.1.2.A IDENTIFICATION for Category 2 NCE (CFR 820.90 a,b)**

**IV.1.2.A.a. Calibration** failure for an LC-MSMS LDT batch (run/series) that occurs with bizarre values or unacceptable frequency as defined in the SOP (See LC-MSMS Method SOPs for acceptable calibration failure frequency, acceptable modifications to a calibration or standard curve/line such as excluding one calibrator, thresholds for acceptable lower limit of quantitation calibrator peak areas, acceptable limits for back-calculated calibrators percent deviation, calibration R2, slope, intercept values, action limits for bizarre values, etc.),

**IV.1.2.A.b. QC** failure for an LC-MSMS LDT batch (run/series) that occurs with bizarre values or unacceptable frequency as defined in the SOP (See QC Materials, Testing, Rules and Acceptance Criteria SOPs, QC Software Application SOP (e.g. BioRad Unity), QC Monthly Review SOP and QC/Corrective Action records),

**IV.1.2.A.c. Metadata.** Failure of LC-MSMS metadata (for most/all samples in a batch) to meet acceptance criteria that occurs with bizarre values or unacceptable frequency as defined in the SOP. Metadata may include but is not limited to internal standard peak areas, product/precursor ion ratios, acceptable baseline, acceptable LC peak width/shape/retention time, acceptable LC peak resolution for closely eluting pairs, absence of interfering LC peaks, and parameters/acceptance criteria for longitudinal metadata tracking. (see LC-MSMS Data Analysis and Review SOP, LC-MSMS Method SOPs, LC-MSMS Metadata Longitudinal Tracking and Acceptance Criteria SOP),

**IV.1.2.A.d. Other equipment/environment.** Failure of QC or other acceptance criteria for pH meters, balances, water purification systems, room/refrigerator/freezer temperatures or other equipment used in LC-MSMS LDT materials preparation or storage or LC-MSMS instrument environment that occurs with unacceptable parameters or frequency as defined in the SOP (CFR 820.70 [c,g]),

**IV.1.2.A.e. Software.** Failure of validation testing for software upgrades of LC-MSMS instrument control or data analysis applications, middleware, interfacing applications.

**IV.1.2.B DOCUMENTATION, EVALUATION, SEGREGATION and DISPOSITION for Category 2 NCE**

When an LC-MSMS LDT fails analytical or post-analytical testing with bizarre values or unacceptable frequency:

a. the LC-MSMS supervisor/designate is notified.

b. As appropriate, the supervisor/designate performs an Evaluation by following troubleshooting protocols including review of (see also LC-MSMS Troubleshooting SOP, Instrument Manuals, LC-MSMS LDT Method SOPs):

i. calibration, QC, metadata, extracted ion chromatograms of the current and previous batches for compliance with acceptance criteria and for trends/shifts/outliers for QC values, longitudinal metadata, other tracked parameters that may have been within acceptance criteria but were trending towards nonconformance,

ii. the LC-MSMS daily SST results against acceptance thresholds and trend/shifts of SST

 values over time, current and previous instrument monthly maintenance calendars and vendor service records for frequency of SST failures, other problems noted, unscheduled maintenance or service,

iii. the batch cover sheet or associated file, and Product Database, for first use of new lots of pre-use validated reagents, mobile phases, columns or pre-columns, extraction media, other consumables,

iv. sample preparation steps and instrument operations with the performing MLS(s) including queries about any unusual events or observations,

v. results for retesting of the same samples with a different, validated, reagent or mobile phase lots, LC column, LC-MSMS instrument, or another suspect component of the LDT,

vi. if applicable – events related to other related equipment/testing/environment/ software for unacceptable values, trends, root causes,

c. If appropriate based on the evaluation, the supervisor/designate completes an NCE report and refers the problem to the LDT-QA Committee for review and investigation (see attached NCE Report Form template).

**IV.1.3 Category 3, Nonconforming LDT Products/Events: Patient Test Results Reported (post-analytical, “After Distribution”, CFR 820.90, 829.100; quality of reported patient results potentially impacted)**

**IV.1.3.A IDENTIFICATION for Category 3 NCE (CFR 820.90 a,b)**

Selected LDT products/events are validated before first use and are then retested periodically during use for patient care testing (after distribution) and may sometimes be classified as NCE. Unlike category 1 and 2 events, for these category 3 events, LDT results used for patient care have already been reported when an NCE is identified. For example, if a periodic autosampler carryover retest fails and LDT results used for patient care have been reported since the last successful carryover test, the failed carryover test becomes NCE. Examples include but are not limited to:

**IV.1.3.A.a.** Automated Liquid Handlers (**ALH)**. A failure of periodic precision checks, robotics, barcode reading or other performance issue or failure that is identified by user observation/maintenance, vendor maintenance/service for an ALH in use for LC-MSMS LDT sample preparation (see ALH Operation and Maintenance SOPs and maintenance/service records),

**IV.1.3.A.b. Pipets.** A failed periodic precision/accuracy check for manual or semi-automated pipets in use for dispensing LC-MSMS LDT samples, internal standards, or used for preparation of extraction reagents, chromatography mobile phases or other materials for which precise/accurate volumetric measurements are critical for acceptable performance (see Pipet Checks SOP and records),

**IV.1.3.A.c. Other Sample Prep Automation.** Performance failure or a problem identified by observation, maintenance or vendor service for automated sample extraction equipment not designated as ALH, in use for LC-MSMS LDT, that is identified after reporting results for patient care (see Operation and Maintenance SOPs and records, service records for stand-alone automated non-ALH extraction equipment such as Biotage Extrahera, Gerstel (SPE) LC-Tech Freestyle, etc.),

**IV.1.3.A.d. Linearity.** Failure of 6-month linearity retesting for an LC-MSMS LDT method/instrument in use for patient care testing (see Linearity Testing SOP and records),

**IV.1.3.A.f. Carryover.** Failure of periodic carryover retesting for LDT methods/instruments in use for patient care testing (see Carryover Testing SOP and records, LC-MSMS LDT Method SOPs),

**IV.1.3.A.g.** **Automated Reporting Rules**. Failure of periodic retesting for LC-MSMS data review reporting rules existing in LC-MSMS, middleware or LIS software applications that are in use for patient care testing.

**IV.1.3.A.h**. **External Quality Assurance (EQA).** Failure of periodic EQA or proficiency testing (PT) events for LDT methods/instruments in use for patient care testing (see PT SOPs including response to failed events, PT records).

**IV.1.3.A.i. Product Stability.** Failure while in use for patient care testing of the validated stability for a pre-use tested product that may affect the accuracy of patient LC-MSMS LDT results (e.g. mobile phase pH retested because of an unacceptable shift in LC retention times, with pH results found to be outside acceptance limits OR extraction buffer with visible fungal growth yielding low extraction recovery). Failure may include but is not limited to validated stability parameters such as storage duration, storage temperature, storage container type, other storage conditions.

**IV.1.3.B DOCUMENTATION, EVALUATION, SEGREGATION and DISPOSITION for Category 3 NCE**

When an LC-MSMS LDT product/event fails periodic re-validation testing or other specification failure while in use for patient care testing:

**a.** the LC-MSMS supervisor/designate is notified.

**b.** As appropriate, the supervisor/designate evaluates the periodic re-validation testing results to verify that a specification failure has occurred,

**c.** As appropriate, the supervisor/designate evaluates device/instrument maintenance, service, and previous re-validation testing records (ALH, pipet, other sample prep automation, linearity, carryover, reporting rules, EQA results) for trends or shifts of re-validation testing results, for previous failures, etc.,

**d.** As appropriate, the supervisor/designate characterizes the nature of any problem detected, e.g. only samples with concentrations above 80% of the upper limit of quantitation have been affected. The duration of the problem may be identified from review of LC-MSMS metadata/other data if possible, if not the duration is assumed to be since the last successful re-validation test.

**e.** The supervisor/designate informs the LC-MSMS laboratory director of the problem,

**f.** The LC-MSMS laboratory director initiates a review to determine the risk to the public health related to the NCE, including specifically risk for patient serious injury or death,

**g.** The supervisor/designate initiates LIS or other searches to identify all LDT results for patient samples that have been reported under NCE conditions.

**h.** The LC-MSMS supervisor/designate and laboratory director initiate an NCE report (see attached NCE Report Form template).

**IV.2 Severe Injury or Patient Death from Category 3 NCE**

If serious injury/death of a patient related to an LC-MSMS LDT result(s) seems possible after preliminary evaluation of a category 3 NCE:

**IV.2.1** additional method/testing information is obtained and attached to the NCE report as needed, for example: review of NCE validation records, the LC-MSMS batch cover sheet, batch calibration and QC, QC history, instrument service records, longitudinal LC-MSMS metadata metrics (e.g. internal standard peak areas), and extracted ion chromatograms, validation retesting records after a problem has been identified and corrected,

**IV.2.3** A NCE is referred within 24 hrs of identification to the LC-MSMS laboratory director and members of the LDT-QA committee.

After making the preliminary evaluation the supervisor/designate summarizes the evaluation, signs the form and enters the signature date/time. If no serious injury/death of a patient related to an LC-MSMS LDT result is cited or suspected, the supervisor refers the NCE in a routine manner to the LDT-QA committee for review at the next scheduled meeting.

See the LDT-QA Committee Actions and Mandatory Reporting SOP for actions to review, investigate if indicated, and performance of mandated reporting following referral of NCE.

**IV.3 NCE Record Storage**

NCE reports are stored (filed) separately by category and severity and clearly labeled based on:

A. Category 1 and 2, no patient sample results affected

B. Category 3, patient sample results affected, no patient serious injury or death

C. Category 3, patient sample results affected with possible serious injury or death and MDR

**V. RESPONSIBILITY**

All personnel involved in validation testing of LC-MSMS LDT products/events are responsible for:

A. Notifying the supervisor/designate within the same shift (<8 hrs) of NCE failures,

B. Physically segregating consumables that fail pre-use validation testing and tagging as “Failed, do not use”,

C. Clearly labeling instruments that fail SST or periodic validation retesting as “Failed, not in use”,

D. Investigating NCE failures appropriate for role, as assigned (see LC-MSMS, ALH, other related instrument/equipment Operating Procedures, LC-MSMS LDT Method Procedures, Job Descriptions).

The LC-MSMS supervisor/designate is responsible for preliminary evaluation of all NCE within 24 hrs. If serious injury/death of a patient appears to be associated with an LC-MSMS LDT result, the supervisor/designate is responsible for referring the event within 24 hrs of NCE occurrence to the LC-MSMS laboratory director and the LDT-QA Committee. The supervisor/designate is responsible for generating NCE Reports after preliminary evaluation.

See the LDT-QA Committee Actions and Mandatory Reporting SOP for next steps after referral of an NCE.

**VI. EXCEPTIONS**

There are no exceptions.

**VII. SUPPLIES**

LC-MSMS LDT Product Database

LC-MSMS LDT Product Validation Testing Records

LC-MSMS LDT Nonconforming Product Report Form

Product tags/barcodes for new untested lots, new lots failing validation, validated new lots not in use, validated lots in use.

**VIII. REFERENCES**

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