

Laboratory Quality Assurance Program  
College of Physicians & Surgeons of Saskatchewan

Laboratory Accreditation  
Inspection Checklist  
2004

**TOXICOLOGY  
INSPECTION**

Toxicology Inspection Document

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## Toxicology Inspection Document

### Introduction

The College of Physicians & Surgeons of Saskatchewan recognizes and acknowledges the expertise of the College of American Pathologists. Many aspects of this document are based on or in some cases, extractions are quoted for those documents.

### **TOX.01 Proficiency Testing**

**TOX.01.001** **yes no n/a**

**Is the laboratory enrolled in the appropriate available graded or approved alternative proficiency testing program for the patient/client testing performed?**

Standard:

The laboratory must participate in an approved program of graded interlaboratory comparison testing appropriate to the scope of the laboratory, if available. This must include enrollment in surveys with analytes matching those for which the laboratory performs patient/client testing.

**TOX.01.002** **yes no n/a**

**Does the laboratory integrate the external Surveys samples within the routine laboratory workload, and are those samples analyzed by personnel who routinely test samples, using the same primary method systems as for patient/client samples?**

Standard:

External proficiency testing samples must be integrated within the routine laboratory workload, and analyzed by personnel who routinely test patient/client samples, using primary method systems. There must not be any interlaboratory communication on proficiency testing data before results reporting. The educational purposes and documentation of proficiency are best served by a rotation that allows all technologists to be involved in the proficiency testing program. Records of these studies must be kept and can be an important part of the personnel and continuing education files of the individuals.

**TOX.01.003** **yes no n/a**

**Is there documented evidence of ongoing evaluation by the laboratory director or designated supervisor of the proficiency testing results?**

Standard:

There must be documentation of ongoing review of proficiency testing results by the Laboratory Director or designated supervisor.

**TOX.01.004** **yes no n/a**

**Is there evidence of evaluation and, if indicated, corrective action in response to "unacceptable" results on the Surveys?**

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### Standard:

There must be thorough evaluation and, if indicated, corrective action in response to each "unacceptable" result on the proficiency surveys report. The evaluation must document the specific reason(s) for the "unacceptable" results and actions taken to reduce the likelihood of recurrence. This must be done within one month after the laboratory receives its survey evaluation.

### **TOX.01.005**

yes no n/a

**For analytes where graded proficiency testing is not available, are other procedures used to validate performance at least semi-annually?**

### Standard:

Where proficiency testing is not available, performance assessment must be conducted at least semi-annually with appropriate procedures such as: participation in ungraded proficiency surveys, split sample analysis with reference or other laboratories, split samples with an established in-house method, assayed material, regional pools, clinical validation by chart review, or other suitable and documented means. It is the responsibility of the Laboratory Director to define such procedures, as applicable, in accordance with good clinical and scientific laboratory practice.

*Verification of quality control (QC) data must be made before patient results are reported. Oversight review must occur at least monthly by the laboratory director or designee. Beyond these specific requirements, a laboratory may (optionally) perform more frequent review at intervals that it determines appropriate for its setting and the assays involved. Quality improvement issues are addressed in the Laboratory General Checklist.*

### **TOX.01.006**

yes no n/a

**Is there a document for the design and evaluation of the laboratory quality control (QC) and quality improvement (QI) program?**

### Standard:

The laboratory must have a comprehensive program for quality control (QC) and quality improvement (QI) in the toxicology section of the laboratory. The QI program must provide the system design and evaluation of proper patient identification and preparation; specimen collection, identification, preservation, transportation, and processing; and accurate result reporting. This system must ensure optimum patient specimen and result integrity throughout the preanalytical, analytical, and post-analytic processes. Opportunities for system improvement are identified and, based on such evaluations, corrective plans are developed and implemented.

### **TOX.01.007**

yes no n/a

**Is there a documented procedure describing methods for patient identification, patient preparation, specimen collection and labeling, specimen preservation, and conditions for**

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**transportation, and storage before testing, and is this procedure consistent with good laboratory practice?**

Standard:

The laboratory must have a completely documented procedure describing methods for patient identification, patient preparation, specimen collection and labeling, specimen preservation, conditions for transportation, and storage before testing. Such protocols must be consistent with good laboratory practice.

**TOX.01.008** **yes no n/a**

**Is there evidence of ongoing evaluation of records of controls, instrument function and maintenance, temperature, etc., for all procedures on all shifts?**

Standard:

Ongoing evaluation of records of controls, instrument function and maintenance, temperature, etc., for all procedures on all shifts must be evident.

**TOX.01.009** **yes no n/a**

**Is there a documented system in operation to detect and correct significant clerical errors, significant analytical errors, and unusual laboratory results?**

Standard:

The laboratory must have a documented system in operation to detect and correct significant clerical errors, significant analytical errors, and unusual laboratory results. One common method is a review of results by a qualified person (technologist, supervisor, pathologist), but there is no requirement for supervisory review of all reported data. The selective use of delta checks also may be useful in detecting clerical errors in consecutive samples from the same patient. In computerized laboratories, there should be automatic "traps" for improbable results.

**TOX.01.010** **yes no n/a**

**Does the system provide for the timely correction of errors?**

Standard:

The system for detecting clerical errors, significant analytical errors, and unusual laboratory results must provide for timely correction of errors. For suspected errors detected by the end user after reporting, corrections must be promptly made if such errors are confirmed by the laboratory.

**TOX.01.011** **yes no n/a**

**In the absence of on-site supervisors, are results of tests performed by personnel reviewed by the laboratory director or designate within the timeframe identified by the Program.**

Standard:

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In the absence of on-site supervisors, the results of tests performed by personnel must be reviewed by the laboratory director, toxicology section director, general supervisor, or person in charge of toxicology on the next routine working shift (generally 72 hours is appropriate).

*The complete procedure manual should be written in compliance and meet the intent of the National Committee for Clinical Laboratory Standards (NCCLS) GP2-A4 without having to precisely copy it. The procedure manual should be available to, and used by, personnel at the workbench and must include: principle, clinical significance, specimen type, required reagents, calibration, quality control, procedural steps, calculations, reference ranges, and interpretation.*

### **TOX.01.012**

**yes no n/a**

**Is a complete procedure manual available at the workbench or in the work area?**

#### Standard:

Note 1: The use of inserts provided by manufacturers is not acceptable in place of a procedure manual. However, such inserts may be used as part of a procedure description, if the insert accurately and precisely describes the procedure as performed in the laboratory. In all cases appropriate reviews must occur.

Note 2: A manufacturer's procedure manual for an instrument/reagent system may be acceptable as a component of the overall departmental procedures. Any modification to or deviation from the procedure manual must be clearly documented.

Note 3: Card files or similar systems that summarize key information are acceptable for use as quick reference at the workbench provided that:

- a. a complete manual is available for reference,
- b. the card file or similar system corresponds to the complete manual and is subject to document control.

Note 4: Electronic (computerized) manuals are fully acceptable. There is no requirement for paper copies to be available for the routine operation of the laboratory, so long as the electronic versions are readily available to all personnel. Such electronic versions must be subjected to proper document control (i.e., only authorized persons may make changes, changes are dated/signed (manual or electronic), and there is documentation of periodic review). Current paper copies of electronically stored procedures should be available at the time of the inspection, or rapidly generated at the request of the inspector.

### **TOX.01.013**

**yes no n/a**

**Is there documentation of at least annual review of all policies and procedures in the toxicology laboratory section by the current laboratory director or designee?**

#### Standard:

Annual review of all policies and procedures in the toxicology laboratory section by the current Laboratory Director or designee is the standard of practice. The director is responsible for

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ensuring that the collection of technical protocols is complete, current, and has been thoroughly reviewed by a knowledgeable person. Technical approaches must be scientifically valid and clinically relevant. To minimize the burden on the laboratory and reviewer(s), it is suggested that a schedule be developed whereby roughly 1/12 of all procedures are reviewed monthly. Paper/electronic signature review must be at the level of each procedure, or as multiple signatures on a listing of named procedures. A single signature on a title page or index of all procedures is not sufficient documentation that each procedure has been carefully reviewed. Signature or initials on a page identified for review of a procedure is acceptable.

**TOX.01.014** yes no n/a  
**Does the Director or designee review and approve all new policies and procedures, as well as substantial changes to existing documents, before implementation?**

Standard:

The Director or designee must review and approve all new policies and procedures, as well as substantial changes to existing documents before implementation. Current practice must match these documents.

**TOX.01.015** yes no n/a  
**Does the laboratory have a system documenting that all personnel are knowledgeable about the contents (including changes) of procedure manuals relevant to the scope of their testing activities?**

Standard:

All personnel must be knowledgeable about the contents (including changes) of procedure manuals relevant to the scope of their testing activities. This does not specifically require annual procedure sign-off by testing personnel.

**TOX.01.016** yes no n/a  
**If there is a change in directorship, does the new director ensure (over a reasonable period of time) that laboratory procedures are well-documented and undergo at least annual review?**

Standard:

If there is a change in directorship of the laboratory, the new Director must ensure (over a reasonable period of time) that all toxicology laboratory procedures are well-documented and undergo at least annual review.

**TOX.01.017** yes no n/a  
**When a procedure is discontinued, is a paper or electronic copy recording initial date of use and retirement date?**

Standard:

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A paper or electronic copy of a discontinued procedure must be maintained for at least 2 years, recording initial date of use and retirement date.

### **TOX.02 Specimen Collection and Handling**

**TOX.02.001** yes no n/a  
**Are procedures adequate to verify sample identity and integrity (includes capillary specimens, aliquots, and dilutions)?**

Standard:

There must be positive identification of specimens to ensure specimen identity and integrity (includes capillary specimens, aliquots, and dilutions).

**TOX.02.002** yes no n/a  
**Are there documented criteria for the rejection of unacceptable specimens, and the special handling of suboptimal specimens?**

Standard:

Documented criteria must be available for unacceptable specimens, and special handling of suboptimal specimens. This does not imply that all "unsuitable" specimens are discarded or not analyzed. If a sample is received that fails to meet acceptability criteria, there must be a mechanism to notify the requesting physician, and to note the condition of the sample on the report if the result is desired by the ordering physician. Some or all tests may not be analytically valid on such a specimen. The laboratory may wish to record that a dialogue was held with the physician, when such occurs.

**TOX.02.003** yes no n/a  
**Is the disposition of all unacceptable specimens documented in the patient report and some other record, such as quality improvement records?**

Standard:

A record of all rejected specimens must be maintained in the patient report and/or quality improvement records. This information is essential to proper patient test management and to the laboratory quality improvement program.

### **TOX.03 Reporting of Results**

**TOX.03.001** yes no n/a  
**Are all patient results reported with accompanying reference (normal) intervals or interpretations wherever possible?**

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### Standard:

The laboratory must report reference (normal) intervals or interpretations with patient results, where such exist. This is important to allow proper interpretation of patient data. In addition, the use of high and low flags (generally available with a computerized laboratory information system) is acceptable.

### **TOX.03.002**

yes no n/a

**Are upper and lower limits of the ANALYTICAL MEASUREMENT RANGE (AMR) for all reportable parameters on instrument systems defined, so results that fall outside these limits are appropriately reviewed and reassayed if necessary before reporting?**

### Standard:

Upper and lower limits of the analytical measurement range (AMR) for all reportable parameters on instrument systems must be defined, and results that fall outside these limits must be appropriately reviewed and reassayed if necessary before reporting.

The AMR is the range of analyte values that a method can directly measure on the specimen without any dilution, concentration, or other pre-treatment not part of the usual assay process. Each laboratory establishes the AMR that provides acceptable results for the intended clinical use. This range can be established or verified using appropriate reference materials; patient specimens, unaltered or altered (i.e., diluted or concentrated) with known analyte concentrations; or calibration materials. If the AMR exceeds the range of values of the materials used for calibration or calibration verification, then the laboratory must establish criteria for verifying the acceptability over time, of the full AMR, and document compliance. The AMR can be revalidated through the process of calibration verification every 6 months.

### **TOX.03.003**

yes no n/a

**Are upper and lower limits of the CLINICALLY REPORTABLE RANGE (CRR) for all reportable parameters on instrument systems defined, so results that fall outside these limits are reported appropriately?**

### Standard:

Upper and lower limits of the clinically reportable range (CRR) for all reportable parameters on instrument systems must be defined so results that fall outside these limits are reported appropriately.

The CRR is the range of analyte values that a method can measure, allowing for specimen dilution, concentration or other pre-treatment used to extend the direct analytical measurement range. Each laboratory establishes the CRR that provides acceptable results for the intended clinical use. Patient specimens, frequently obtained from patients with disease conditions that produce very abnormal analyte concentrations/activities, are typically used in a dilution or concentration protocol to establish or verify the CRR. Analyte values less than or greater than the CRR are usually reported as greater than or less than some measurable value.

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The CRR is usually a characteristic of the assay technology and is established at the time of initial validation of a method in a laboratory. Once established, it does not need to be re-evaluated unless there are instrumentation or methodology changes for the analyte. The CRR does not need to be revalidated every 6 months.

**TOX.03.004** yes no n/a  
**Are documented criteria established for immediate notification of a physician or other clinical personnel responsible for patient care when the results of certain tests exceed critical limits important for prompt patient management decisions?**

Standard:

Criteria for immediate notification of a physician or other clinical personnel responsible for patient care must be established for critical tests. These criteria may be listed in the procedure manual and/or a separate policy manual. The bench technologists must be familiar with critical limits for procedures that they perform.

**TOX.03.005** yes no n/a  
**Is there documentation of prompt notification of the proper clinical individual of results of all critical toxicology values?**

Standard:

Records must be maintained indicating the notification of the appropriate clinical individual promptly after observing critical or alert toxicology results. These records should include: date, time, responsible laboratory individual, clinician notified and test results. In addition, the laboratory should document any failure of attempts to notify the appropriate person of critical results, and document the action taken to prevent recurrence of this problem.

**TOX.03.006** yes no n/a  
**Are reagents and solutions properly labeled, as applicable and appropriate, with the following elements:**

1. content and quantity, concentration or titer,
2. storage requirements,
3. date prepared or reconstituted by laboratory,
4. expiration date?

Standard:

All reagents must be properly labeled, as applicable and appropriate, with the above listed elements and others deemed necessary.

**TOX.03.007** yes no n/a  
**Are all reagents stored as recommended by the manufacturer?**

Standard:

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Reagents must be stored according to manufacturer's instruction, in order to prevent environmentally-induced alterations that could affect test performance. There must be documentation that the defined are maintained and corrective action is taken when tolerance limits are exceeded.

**TOX.03.008** **yes no n/a**  
**Are all reagents used within their indicated expiration date?**

Standard:

Reagents must not be used beyond their stated or assigned expiration date.

**TOX.03.009** **yes no n/a**  
**Are new reagent lots checked against old reagent lots or with suitable reference material before or concurrently with being placed in service?**

Standard:

New reagents must be tested in parallel with old reagents or checked by some other reference material before or concurrently with being placed in service. For qualitative tests, minimum cross-checking includes re-testing at least one known positive and one known negative patient sample from the old reagent lot against the new reagent lot, ensuring that the same results are obtained with the new lot. Good clinical laboratory science includes patient-based comparisons in many situations, since it is patient results that are "controlled". The use of a weakly positive control is required when patient results are reported in that fashion.

**TOX.03.010** **yes no n/a**  
**If there are multiple components of a reagent kit, does the laboratory use components of reagent kits only within the kit lot unless otherwise specified by the manufacturer?**

Standard:

The laboratory must use components of reagent kits only with other kits that are in the same lot number unless otherwise specified by the manufacturer.

**TOX.03.011** **yes no n/a**  
**Are common interferences evaluated for all analytes measured with each reagent system, or is credible information available?**

Standard:

Common interferences should be evaluated for each analyte measured with each reagent system, or information should be available that is consistent with NCCLS guideline EP7-P.

## **TOX.04 Calibration and Standards**

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### Commentary:

*INTRODUCTION: Calibration of a test method, calibration verification, and validation of the analytical measurement range (AMR) are required to substantiate the continued accuracy of the method. The term "calibration verification" refers to both the verification of correct method calibration and validation of the AMR. This Checklist uses separate terms to identify 2 distinct processes that are required for good laboratory practice. The following definitions of terms are offered as a guide to inspectors and laboratories:*

*ANALYTICAL MEASUREMENT RANGE VALIDATION: The process of confirming that the assay system will accurately measure the concentration or activity of the analyte over the AMR. The materials used for validation must be known to have matrix characteristics appropriate for the method. The matrix of the sample (i.e., the environment in which the sample is suspended or dissolved) may influence the measurement of the analyte. In many cases, the method manufacturer will recommend suitable materials. The test specimens must have analyte values which, at a minimum, are near the low, midpoint, and high values of the AMR. Specimen target values can be established by comparison with peer group values for reference materials, by assignment of reference or comparative method values, and by dilution ratios of one or more specimens with known values. Each laboratory must define limits for accepting or rejecting validation tests of the AMR. The AMR must be revalidated at least every 6 months and following changes in lots of analytically critical reagents or major system components.*

*CALIBRATION: The set of operations which establish, under specified conditions, the relationship between system/instrument response and the corresponding concentration/activity values of an analyte. Calibration procedures are typically specified by a method manufacturer, but may also be established by the laboratory.*

*CALIBRATION VERIFICATION: The process of confirming that the assay system will accurately recover the concentration or activity of the analyte over the AMR. One must use matrix-appropriate materials (i.e., materials with a matrix closely resembling the patient test samples) with known or determined values, and analyze them in the same manner as patient specimens. Accurate results are defined as results within the analytical goals established by the laboratory for each analyte, or comparison with peer group values or reference material.*

*Calibration verification requires assaying specimens having at least minimum, midpoint, and maximum values of the analytical measurement range. If calibration verification includes these 3 values, and the data obtained meet the laboratory's acceptance criteria, recalibration is not necessary. The routine use of 2 levels of quality control (QC) material does not satisfy the requirements for calibration verification, as these verify only the area of the curve between these 2 levels; full calibration verification involves at least 3 levels of material with assayed values at the mid-point and the extremes of the analytical measurement range.*

*CALIBRATION VERIFICATION ACCEPTABLE LIMITS: Each laboratory must define limits for accepting or rejecting calibration verification tests.*

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*CALIBRATION VERIFICATION INTERVAL: Calibration verification must be performed at least once every 6 month. Successful verification certifies that the calibration is still valid; unsuccessful verification requires remedial action. The performance of a calibration verification procedure resets the calendar to a new maximum 6-month interval before the next required reassessment.*

*CALIBRATION VERIFICATION-AMR VALIDATION MATERIALS: The matrix of the materials must be appropriate for the clinical specimens assayed by that method. The values must be appropriate for the AMR as noted above. Materials may include, but are not limited to:*

- 1. linearity material of appropriate matrix,*
- 2. proficiency testing survey material or proficiency testing survey-validated material,*
- 3. previously tested patient specimens, unaltered,*
- 4. previously tested patient specimens, altered to elevated analyte concentrations by spiking in known amounts of an analyte,*
- 5. previously tested patient specimens, altered to lower analyte concentrations by dilution or other technique,*
- 6. primary or secondary standards or reference materials with matrix characteristics appropriate for the method,*
- 7. calibrators used to calibrate the analytic measurement system.*

*In general, routine control materials are not suitable for calibration verification, except in specific situations where the material is specifically designated as suitable for verification of the vendor's calibration process.*

*RECALIBRATION: The repeat performance of the calibration procedure after a certain period of time or when an event occurs that is suspected to significantly change the accuracy of patient values.*

*RECALIBRATION INTERVAL: This is established by each laboratory. Manufacturers of method systems often recommend a standard interval when the method system is stable. The recalibration interval may be extended if calibration verification is performed and the results meet the established criteria of the laboratory. Criteria for determining the recalibration or calibration verification interval include:*

- 1. a change of chemically or physically active or critical reagents,*
- 2. QC fails to meet established criteria,*
- 3. after major maintenance or service,*
- 4. calibration verification data fail laboratory acceptance criteria,*
- 5. when recommended by the manufacturer.*

*Each laboratory must establish its own criteria for recalibration interval.*

### **TOX.04.001**

**Are calibration procedures for each method adequate, and are the calibration results documented?**

**yes no n/a**

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Standard:

Calibration procedures for each method must be adequate, and results documented for each system employed.

**TOX.04.002**

yes no n/a

**Are high quality matrix-appropriate materials used for calibration and calibration verification whenever possible?**

Standard:

High quality calibration materials must be used whenever possible. Calibrators or calibration materials have defined analyte target values and appropriate matrix characteristics for the clinical specimens and specific assay method.

**TOX.04.003**

yes no n/a

**Are all drug calibration materials documented as to quality?**

Standard:

There must be documentation of the quality of drug standards used by the laboratory. The laboratory may use manufacturer's certification data for the purity of the drug calibration standards, but the laboratory must still independently document the quantitative accuracy of any calibrator solutions created from the calibration standard. If manufacturer's certification of purity is not available, then the laboratory must validate the purity by determining if any significant extraneous compounds are present using the appropriate analytical methods. Minimum requirements would be the analysis of a pure drug standard solution using the assay method used for drug analysis to demonstrate that no interfering compounds are present.

**TOX.04.004**

yes no n/a

**If the laboratory prepares calibrators and controls in-house, does it use different sources or lot numbers of drug calibration standards (when possible) for the creation of calibrators and controls, or at least prepare these materials separately?**

Standard:

The laboratory must (1) use different sources or lot numbers of calibration standards (when possible) for the preparation of calibrators and controls, or (2) separately prepare its calibrators and controls.

**TOX.04.005**

yes no n/a

**Are all calibration materials properly labeled as to content and calibration values?**

Standard:

Calibration materials must be properly labeled as to content and calibration values. Complete values need not necessarily be recorded directly on each vial of calibrator material, so long as

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there is a clear indication where specific values may be found for each analyte tested and each analyzer used by the laboratory.

**TOX.04.006** yes no n/a  
**Do labels on calibrators include dates placed in service and expiration dates?**

Standard:

Labels on calibrators must include dates placed in service and expiration dates.

**TOX.04.007** yes no n/a  
**Are criteria established for frequency of calibration verification, and the acceptability of results?**

Standard:

Criteria must be established for calibration verification. Such criteria typically include:

1. changes of reagent lots for chemically or physically active or critical components, unless the laboratory can demonstrate that the use of different lots does not affect the accuracy of patient test results and the range used to report patient test data,
2. QC fails to meet established criteria,
3. after major maintenance or service,
4. when recommended by the manufacturer,
5. at least every 6 months.

A laboratory must also have documented criteria for acceptable calibration verification results. When calibration verification criteria are exceeded, the laboratory must recalibrate.

**TOX.04.008** yes no n/a  
**Is the method system recalibrated when calibration verification fails to meet the established criteria of the laboratory?**

Standard:

The method system must be recalibrated when calibration verification fails to meet the established criteria of the laboratory.

**TOX.04.009** yes no n/a  
**Is verification of the analytic measurement range (AMR) performed with matrix-appropriate materials of known analyte value appropriate to the AMR of the method system, and is the process documented?**

Standard:

Calibration, calibration verification, and validation of the analytical measurement range are required to substantiate the continued accuracy of a test method. The term "calibration verification" to refer to both verification of correct method calibration and validation of the

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analytical measurement range (AMR). This Checklist uses separate terms to identify 2 distinct processes that are both required for good laboratory practice.

The AMR is the range of analyte values that a method can directly measure on the specimen without any dilution, concentration, or other pretreatment that is not part of the usual assay process. Validation of the AMR is the process of confirming that the assay system will accurately measure the concentration or activity of the analyte over the AMR. The materials used for validation must be known to have matrix characteristics appropriate for the method. The matrix of the sample (*i.e.*, the environment in which the analyte is dissolved/suspended) may influence or alter the measurement of the analyte. In many cases, the method manufacturer will recommend suitable materials. The test specimens must have analyte values which as a minimum are near the low, midpoint, and high values of the AMR. Specimen target values can be established by comparison with peer group values for reference materials, by assignment of reference or comparison method values, and by dilution ratios of one or more specimens with known values. Each laboratory must define limits for accepting or rejecting validation tests of the AMR. The AMR must be revalidated at least every 6 months and following changes in lots of analytically critical reagents or major system components.

### **TOX.04.010**

yes no n/a

**Are criteria established for verifying the analytical measurement range, and is compliance documented?**

Standard:

Criteria must be established and documented for verifying the analytical measurement range (AMR). If the materials used for calibration or for calibration verification include low and high values that are near the stated AMR, and if calibration verification data are within the laboratory's acceptance criteria, the AMR has been verified; no additional procedures are required. If the calibration and/or calibration verification materials do not include the full AMR, or the laboratory extends the AMR beyond the manufacturer's stated range, the AMR must be verified by assaying materials reasonably near the lowest and highest values of the AMR.

### **TOX.04.011**

yes no n/a

**If the laboratory has more than one method-system for performing tests for a given analyte, are they checked against each other at least twice a year for correlation of patient results?**

Standard:

When more than one instrument-reagent system is used to generate any patient-reportable analyte, it is important that the laboratory verify comparability of results for patient specimens. Checks for calibration agreement and correlation of patient results must be done at least twice a year. The selection of fresh human samples (whole blood, serum, plasma, urine, *etc.*), rather than simply stabilized commercial controls with potential matrix effects, is important to directly address the issue of whether a patient sample yields the same results on all of the laboratory's

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instruments. Statistical agreement of commercial control materials across instruments does not guarantee comparability of patient specimen results.

### **TOX.05      Controls**

*Controls are samples that act as surrogates for patient specimens. They are periodically processed like a patient sample to monitor the ongoing performance of the entire analytic process.*

*Most quantitative tests are traditionally monitored with 2 levels of liquid control material (procedural control). This is done at a frequency within which the accuracy and precision of the measuring system is expected to be stable (based upon manufacturer's recommendations), but at a minimum each day of that patient testing is performed. The daily use of 2 levels of liquid control may NOT be required for certain test systems, where the daily use of instrument and/or electronic controls is demonstrably sufficient to validate that calibration status is maintained within acceptable limits.*

#### **TOX.05.001**

**yes no n/a**

**For QUANTITATIVE tests, are control materials at more than one concentration (level) used at least daily?**

Standard:

For quantitative tests, an appropriate quality control (QC) system must be in place. The daily use of 2 levels of instrument and/or electronic controls as the only QC system is acceptable. The laboratory is expected to provide documentation of its validation of all instrument-reagent systems for which daily controls are limited to instrument and/or electronic controls. This documentation must include the federal complexity classification of the testing system and data showing that calibration status is monitored.

#### **TOX.05.002**

**yes no n/a**

**Has a statistically valid target range been established for each lot of control material by repetitive analysis in runs that include previously tested control materials (quantitative tests)?**

Standard:

The laboratory must establish a statistically valid target range for each lot by repetitive analysis in runs that include previously tested control materials (quantitative tests).

#### **TOX.05.003**

**yes no n/a**

**For tests that do NOT include built-in positive and negative controls, are known positive and negative controls tested on each day of analysis for all qualitative or semi-quantitative tests?**

Standard:

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For qualitative and semiquantitative tests that do NOT include built-in positive and negative controls, known positive and negative controls must be tested on each day of analysis.

**TOX.05.004** yes no n/a  
**For tests that DO include built-in positive and negative controls, is a positive and negative external control tested with each new kit lot number or different shipment of a given lot number for all qualitative or semi-quantitative tests?**

Standard:

For qualitative and semiquantitative tests that do include internal positive and negative controls, a positive and negative external control must be tested with each new kit lot number or different shipment of a given lot number. Internal quality control tests can be used for subsequent testing, based upon manufacturers' recommendations. For panels or batteries, controls must be employed for each antigen or antibody sought in patient specimens.

**TOX.05.005** yes no n/a  
**Are quality control data organized and presented so they can be evaluated daily by the technical staff to detect problems, trends, etc?**

Standard:

Results of controls must be recorded or plotted in a manner to readily detect a malfunction in the instrument or in the analytic system. These control records must be readily available to the person performing the test. Quality control data must be organized and presented so they can be evaluated daily by the technical staff to detect problems, trends, *etc.*

**TOX.05.006** yes no n/a  
**Are tolerance limits defined for control procedures?**

Standard:

Tolerance limits for control procedures must be defined. For tests with numeric results, recovery ranges supplied by manufacturers of assayed controls must not be substituted for quality control range limits determined by the laboratory on its own equipment.