Gaining UKAS ISO15189 Accreditation: A Blood Transfusion Laboratory Perspective

Dawn Smith & Kerry Dowling

University Hospital Southampton NHS Foundation Trust

Overview

- CPA and ISO
  - What's the same
  - What's changed
- Pre-inspection
- UHS inspection experience
- Advice and possible solutions
  - Uncertainty, traceability, batch acceptance, validation and verification

Why ISO

- 2009 CPA became wholly owned by UKAS
- Strategy for modernising pathology services
- UKAS managing transition of all CPA accredited laboratories to UKAS accreditation (*ISO 15189:2012)*
- From October 2013

Inspections

- Assessed against CPA and ISO 15189 standards simultaneously
- Non-conformances raised against one or both sets of standards
- Clearing findings: 8 weeks (CPA), 12 weeks (ISO)
- Subsequent inspections ISO 15189 only

CPA and ISO: What's the Same?

- Format of inspection visit (meetings and feedback)
- Multiple ways of meeting standard
- Assessment team looking for conformity

CPA and ISO: What's Different?

- Different approach and expectations of assessment
  - No vertical audits
- Different focus
  - Emphasis on the test
  - Move away from CPA focus on H&S and working environment
  - Validation, Traceability, Uncertainty of measurement, Equipment records, EQA/IQC, Staff suggestions, Competency assessment

MHRA and ISO

- What's already in place that will help:
  - Competency
  - Validation
  - Traceable calibration certificates
  - Batch acceptance
  - Return to service
- BUT- need to ensure in place in Haematology etc. too

Pre-inspection

- Preparation
  - Gap analysis
  - Audit
  - Working groups

- List 2 weeks before with tests that they would inspect- adhered rigorously

UHS ISO Inspection

- 3 days 3 inspectors (plus UKAS expert)
- Test not assessed during visit assessed off-site after inspection
- 27 findings
- Findings cleared April 2014
  - CPA accreditation May 2014
  - ISO accreditation subject to subject to review by an independent decision maker

Management Review (Standard 4.15)

- Staff suggestions
- Review of requests and suitability of procedures and sample requirements
- Performance of suppliers

Batch Acceptance (Standard 5.3.2.3)

- More explicit than CPA
- New lot OR shipment
- Reagents AND consumables
- When to test
  - Verified for performance BEFORE use in examination
- What to test
  - Product inserts
  - Initial physical quality check
  - QC/patient samples
  - Acceptance criteria

Return to Service (Standard 5.3.1.5)

- Following repair, maintenance or removal from direct control
- Verification of performance to meet specified acceptance criteria
- Before being put back into use

IQC and EQA
(Standards 5.6.2 and 5.6.3)

- IQC
  - Failure procedure
  - Trending
- EQA
  - Alternative approaches

Traceability of Measurement (Standard 5.3.1.4)

- " the property of the result of the measurement or the value of a standard, whereby it can be related to stated references, usually national or international standards, through a unbroken chain of comparisons all having stated uncertainties".

Traceability of measurement

- Metrological traceability
- What does this mean for a transfusion laboratory?
- Pipettes, balances- verification
- Blood fridge calibration
  - Main finding in BT
  - Gap in traceability
  - No current UK supplier ISO 17025 accredited to calibrate on-site
  - Post-calibration verification

Traceability Example

- 20 readings- working and reference
- **Calculation of uncertainty**
  - √ [SD(reference)^2 + SD(test)^2] x coverage factor
- **Calculation of bias**
  - Reference (UKAS certificate) + mean (working-reference value)
- **Acceptance=** Uncertainty + Bias
  - MHRA +/- 0.5°C
  - MHRA Cold Chain Clarifications 1&2 http://www.transfusionguidelines.org.uk/regulations/clarification/storage-and-distribution/cold-chain
  - Adjusting alarm limits?

Validation and Verification of Examination Procedures (Standard 5.5.1)

- Stipulation on how to document validation/verification procedures
- Retrospective - no cut-off
- Loan equipment
- Choice of performance characteristics

Some Examples

- Precision
  - Repeatability
  - Between analysers

- Limit of detection
  - Lowest value that can be detected reliably with pre-defined goal
    - e.g. Anti-D = 0.05 IU/mL

Recent Analyser Retrospective Verification

- IQ/OQ from manufacturer
- PQ
  - IQC precision test
  - Sample comparison with different analyser and between analysers
  - NEQAS evaluation in place of full sample comparison
  - Detection limits check
  - Interface verification
  - Uncertainty of measurement data review
  - Review of non-conformances

Uncertainty of Measurement (Standard 5.5.1.4 & Lab 12)

- Uncertainty

  " A parameter, associated with the result of a measurement, that characterises the dispersion of the values that could reasonably be attributed to the measurand."

- Measurand

  " The specific quantity subject to measurement."

Theory of Uncertainty of Measurement

- Provides a quantitative indication of the level of confidence that a lab has in each measurement
- UKAS reasons:
  - Inter- and intra- laboratory comparison
  - User result interpretation
  - Evaluation of all components including human error leading to uncertainty
  - Identification of improvement areas
  - Method validation

2 Types of Measurement Uncertainty

- Type A
  - Derived from repeated measurements and statistical analysis

- Type B
  - Derived from non-statistical means
    - manufacturer's assay validation data
    - intra individual biological variation
    - professional opinion.

Uncertainty of Measurement- Application to Blood Transfusion

- Measurement uncertainties may be calculated using quantity values obtained by the measurement of quality control materials
  - Changes of reagent
  - Different operators
  - Scheduled instrument maintenance
- IQC
- Minimum of 6 months data

Blood Group Uncertainty

- Non-numerical values- positive predictive value or negative predictive value where uncertainty = (1-PPV) or (1-NPV)
- Report an uncertainty of Positives results as x%.
- Blood group
- QC run 1520 times in year
  - 1515 times true positive
  - 5 times false positive
  - PPV = 1515/1520
  - Uncertainty= (1-0.97)*100%
- Uncertainty =0.3%

Conclusion and Take-Away Advice

- Change in focus
- CPA findings for things never picked up before
- Achievable with existing resources if quality becomes part of everyone's role
- QPulse or equivalent to manage not only documents but also assets
- External suppliers: ISO 17025