INTEGRATED BIOREPOSITORY OF H3AFRICA UGANDA

MAKERERE UNIVERSITY

COLLEGE OF HEALTH SCIENCES

STANDARD OPERATING PROCEDURE

TITLE: **ASSAY VALIDATION**		**PAGE 1 of 7**
SOP #: **IBRH$_3$AU-SOP-MGT-007.1**	Effective Date: **09/01/2014**	Next Rev: **DEC 2015**
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VALIDATION AND RETIREMENT

	NAME	DATE
Validated by:		
Retired by:		

ACKNOWLEDGEMENT OF READING AND UNDERSTANDING

I have received and understood the training on this SOP. If I have not understood the training I have asked the trainer to retrain me to ensure that I completely understand all the requirements.

	NAME	SIGNATURE	DATE
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1. PURPOSE

To give guidelines to follow when adopting new techniques or when buying/installing new equipment

2. PURPOSE

This SOP applies to all IBRH3AU personnel involved in adopting new techniques and purchasing equipment.

3. RESPONSIBILITIES

Personnel	Responsibility
Scientific Director	Approves new techniques
Biorepository Coordinator	Initiates Validation Procedures
Biorepository Manager	Determines need for new techniques

3.1 Validation; the assurance that a product, service, or system meets the needs of the customer and other identified stakeholders; it often involves acceptance and suitability with users.

3.2 Verification; the evaluation of whether or not a product, service, or system complies with a regulation, requirement, specification, or imposed condition i.e. fit for purpose.

4. PROCEDURES

The procedure for validating new techniques shall include:

4.1 Precision

Precision is reproducibility - the agreement of the measurements of replicate runs of the same sample. It is the process of determining the range of random error. The precision is measured in terms of coefficient of variation (CV).

4.2 Reproducibility

Within run and between run reproducibility will be determined by running the negative control and positive control as follows: For within run, at least 20 replicates of negative control and at least 20 replicates positive control will be tested in one run each. For between run reproducibility, both negative and high positive control will be tested at least once per day but not more than 5 times per day to obtain a total of 20 replicates each.

Acceptability criteria: For the between run and within run precision, the optical densities from the negative and positive controls will be used to calculate the coefficient of variance and compared to the manufacturer's claims for reproducibility. The laboratory CV should be less than or equal to the manufacturer's stated CV. In the event that an assay does not perform as expected, the Laboratory Director will determine acceptability.

4.3 Accuracy/Correlation

Accuracy is the true value of a substance being measured. Verification of accuracy is the process of determining that the test system is producing true, valid results. This can be verified by:

4.3.1 Assaying materials with assigned values.

4.3.2 Comparing patient specimen results with a method of long standing use.

4.3.3 Verifying results from inter-laboratory survey specimens.

4.3.4 Splitting specimens with another sufficiently accredited laboratory.

4.3.5 The results must demonstrate the system is accurate enough to provide clinically valid patient results. Limits of acceptability should be set by the Laboratory Director.

4.3.6 Acceptability criteria: diagnostic sensitivity (true positive rate) and diagnostic specificity (true negative rate) must meet or exceed manufacturer's stated claims.

4.4 Linearity/Reportable range

4.4.1 Linearity is not applicable to qualitative methods.

4.4.2 The reportable range for qualitative methods is negative or positive.

4.5 Analytical Sensitivity is the lowest concentration of an analyte that can be measured (Lower Limit of Detection). For an FDA approved unmodified method the manufacturer's stated sensitivity will be used.

4.6 Analytical Specificity is the determination of the affect of interfering substances. For an FDA approved unmodified method the manufacturer's stated specificity will be used.

4.7 Verification of Expected Values/Reference Ranges

Technique specific

4.8 Diagnostic Sensitivity

Sensitivity relates to the test's ability to identify positive results. The sensitivity of a test is the proportion of people that are known to have the disease who test positive for it.

Diagnostic Sensitivity (True positive rate) = 100 x [TP/ (TP+FN)].

Percent Positive Agreement (Positive Predictive Value) =100 x TP/ (TP+FP).

4.9 Diagnostic Specificity

Specificity relates to the test's ability to identify negative results. The specificity of a test is defined as the proportion of patients that are known not to have the disease who will test negative for it. This can also be written as:

Diagnostic Specificity (True negative rate) = 100 x [TN/ (FP+TN)].

Percent Negative Agreement (Negative Predictive Value) =100 x TN/ (TN+FN).

Calculation of Results	Lab Result (%)	Expected Result	Acceptability
Sensitivity= 100 x [TP/(TP+FN)]			
Specificity= 100 x [TN/(FP+TN)]			
Positive Agreement (Positive Predictive Value) =100 x TP/(TP+FP)			
Negative Agreement (Negative Predictive Value) = 100 x TN/(TN+FN)			

4.10 Method Approval

The final decision on methodology validation and acceptance is made after a careful review of all the studies performed as part of the complete method validation process. The Scientific Director shall make the ultimate decision on method validation. Method acceptance is based on the results from the above studies plus an evaluation of the new method's cost effectiveness, turn-around-time, laboratory staff training needs, and any other relevant operational considerations.

5 REFERENCES

5.1 GCLP Workshop and Workbook18-20 May 2008, Verification of Performance Specifications, pages 1-33.

5.2 Clinical and Laboratory Standards Institutes (CLSI), *User Protocol for Evaluation of Qualitative Test Performance; Approved Guideline--Second Edition.* CLSI document EP12-A2 (ISBN 1-56238-654-9). Clinical and Laboratory Standards Institute, 940 West Valley Road, Suite 1400, Wayne, PA 19087-1898 USA, 2008.

5.3 EP Evaluator Release 8, David G. Rhoads Associates Inc., www.dgrhoads.com.

5.4 James O. Westgard, Online Validation Training, Westgard QC, Inc. www.westgard.com, Sections 11-Determining Bias,12- Estimating Trueness, and 13-Judging Method Acceptability

6 REVISION HISTORY

Revision No	Effective Date	Description of Changes Made from Preceding Revision	Approved by/ Date

ANNEX 1: DOCUMENTATION OF SUGGESTED CHANGES TO THIS SOP

CLAUSE	SUGGESTION	BY	DATE