TRAINING COURSE

# Validation & Transfer of Methods for Pharmaceutical/Biopharmaceutical Analysis

***Approved by the Royal Society of Chemistry for purposes of continuing professional development.***

This course will provide you with the requisite scientific knowledge and understanding of analytical method validation, verification and transfer to allow informed interpretation of current regulatory guidance from EMA, FDA and ICH, e.g. Q2(R1).

There are two versions of the course. You can choose between either the 'Pharmaceutical Analysis' version (aimed at test methods that are used for small molecules), or the 'Biopharmaceutical Analysis' version (aimed at test methods that are used for large molecules). The difference between these alternative versions is that the case studies, real life scenarios, and examples used during the training are tailored to the types of test methods commonly encountered for these different types of molecules. Additionally, advice on regulatory guidance and expectations is relevant to the specific needs of the learner.

***Course overview***:
The data generated using analytical test methods is essential for many of the critical decisions made in the pharmaceutical industry. To be confident in the integrity of this data it is crucial that the methods are fit for purpose. To demonstrate that a method is fit for purpose will require either a validation, verification or transfer study, depending on the source of the method in question.

This course provides a detailed explanation of how these studies are performed, enabling a full understanding of method performance characteristics and associated statistics, and how they are applied to the techniques used for analysing drug related samples.

***Learning Objectives:***

1. Understand the purpose of analytical method validation and the principles of measurement uncertainty.
2. Define the parameters used for method validation, i.e. the validation characteristics as per ICH Q2(R1) of: specificity, accuracy, range, linearity, precision, detection limit, quantitation limit and robustness.
3. Generate a validation, verification or transfer protocol, as appropriate, including practically relevant experiments and acceptance criteria.



MOURNE TRAINING SERVICES LIMITED • Registered in Northern Ireland under company number NI637196
Registered address: 5 Moor Hill Road • Newry • Co. Down • BT34 2QJ
Tel: +44 (0) 28 3083 4938 • Email: info@mournetrainingservices.co.uk • Web: www.mournetrainingservices.co.uk

4. Interpret the results of validation, verification and transfer studies using appropriate statistics.
5. Understand the different possible approaches that may be used for analytical method transfer as per available guidance from EMA, USP <1224>, FDA and WHO.
6. Review analytical procedures in terms of transfer to another laboratory and identify potential problems.

***Delivery options for this course***:
The full course takes place over 3 days but if preferred, it is possible to attend the first 2 days only for a method validation course or the last day only for a method transfer and verification course. In the case of attendance on the last day only it is essential that delegates are familiar with validation characteristics since these are used for method transfer and verification.

***Open-enrolment training courses:***
You can attend one of our open enrolment training courses at the following locations:
- Hilton Garden Inn Heathrow, London, UK;
- Metro Hotel Dublin Airport, Dublin, Ireland; and
- GLS Campus Berlin, Germany.

The courses are available throughout the year, refer to the MTS website for full details.

***On-site training courses:***
We can deliver the course at your site including any required customisation to meet your specific requirements. Contact us to discuss your training needs and for a quotation.

***Use of case studies and real life scenarios***:
Delegates are invited to bring along any real life examples that they would like advice on during the training. These may be discussed during group exercises, or, where intellectual property is an issue, privately with the trainer.

***This course is suitable for:***
Anyone who needs to understand how methods are validated, verified or transferred, either to design and carry out the investigation, or to interpret the data generated. For example:
- Analytical chemists;
- Laboratory managers/ supervisors;
- Quality control analysts/ managers;
- Quality assurance managers;
- Regulatory affairs managers;

***Included in the course fees:***
- Comprehensive course hand-outs;
- Certificate of Attendance;
- Access to training resources via e-MTS;
- Optional post training assessment (leading to Certificate of Training);
- Post training support;
- Lunch and refreshments (for open-enrolment courses only).

# Course Agenda & Outline

## Day 1

| Timings (approximate): | Content: |
|---|---|
| 0900 to 1030 | Introduction:<br>• The purpose of validation in the pharmaceutical industry.<br>• Available guidelines for method validation, e.g. ICH Q2(R1), FDA, etc.<br>• The types of analytical methods for pharmaceutical analysis that require validation.<br>• Definition of analytical method validation characteristics. |
| *1030 to 1045* | *Refreshment break* |
| 1045 to 1130 | Uncertainty in Analytical Measurement<br>• Sources of uncertainty;<br>• Assessing measurement uncertainty.<br>• Method validation and uncertainty; |
| 1130 to 1230 | Statistics for method validation:<br>• The mean, the standard deviation and confidence intervals – definition and calculation.<br>• Student's t-distribution for small sample sets.<br>• Test for outliers in method validation – Dixon's test.<br>• Statistical significance and comparative studies in method validation – Student's t-test. |
| *1230 to 1315* | *Lunch* |
| 1315 to 1500 | Validation characteristics, as defined in ICH Q2(R1):<br>• Range – ranges to validate for different types of pharmaceutical analytical methods; required reporting thresholds for impurities analysis.<br>• Detection limit & quantitation limit – methods of determination; contrast of instrument and practical limits; experimental procedure; acceptance criteria.<br>• Robustness – relevance in validation studies; factors and levels for investigation; experimental design for robustness investigations; stability of test solutions. |
| *1500 to 1515* | *Refreshment break* |
| 1515 to 1645 | • Specificity – discussion of specificity and selectivity for qualitative and quantitative analytical methods; investigation of specificity/selectivity; performing stress studies; peak purity for chromatographic methods. |

## Day 2

| Timings (approximate): | Content: |
|---|---|
| 0900 to 1030 | Validation characteristics continued:<br>• Accuracy – the relationship between accuracy and trueness; preparation of recovery samples for different types of drug-related samples and inherent problems; experimental procedure; recovery calculations; acceptance criteria. |
| *1030 to 1045* | *Refreshment break* |
| 1045 to 1230 | • Linearity – verification of the calibration method; single point and multi-level calibration; regression analysis and associated statistics; use of residuals; combined assay and impurities methods; experimental procedure. |
| *1230 to 1315* | *Lunch* |
| 1315 to 1500 | • Precision (repeatability, intermediate precision & reproducibility) - the relationship between accuracy, trueness and precision; choosing suitable samples for precision; options if homogenous material is not available, acceptance criteria, Analysis of Variance (ANOVA). |
| *1500 to 1515* | *Refreshment break* |
| 1515 to 1545 | • Precision *continued* |
| 1545 to 1645 | Validation protocol & report:<br>• Choosing validation characteristics for different types of analytical methods;<br>• Designing experimental procedures for validation studies – number of replicates, concentration of test solutions and number of concentration levels;<br>• Setting appropriate acceptance criteria for each validation characteristic;<br>• Verification of pharmacopeia methods;<br>• Method validation during drug development and ways to reduce validation testing;<br>• Execution of the validation protocol;<br>• Validation reporting requirements. |

## Day 3

| Timings (approximate): | Content: |
|---|---|
| 0900 to 1030 | The requirements for method verification and transfer in the pharmaceutical industry.<br>Differences between method verification and transfer.<br>Different approaches to transfer:<br>• Comparative testing;<br>• Co-validation between two or more laboratories;<br>• Revalidation; and<br>• Transfer waiver.<br>The role of risk analysis in verification and transfer.<br>Review of available regulatory guidance for method verification and transfer, e.g., EMA, FDA, USP <1224> Transfer of Analytical Procedures, WHO.<br>Main steps in method verification and transfer. |
| *1030 to 1045* | *Refreshment break* |
| 1045 to 1230 | Review of the method in terms of:<br>• The adequacy of the content of the method and how it is written;<br>• Potential technical challenges; and<br>• Existing method knowledge and robustness.<br>Training requirements during method transfer studies. |
| *1230 to 1315* | *Lunch* |
| 1315 to 1500 | Preparation of the verification/ transfer protocol in compliance with available regulatory expectations, to include:<br>• Required materials, e.g., drug samples, reference standards;<br>• Experimental procedure, e.g., numbers of batches and replicates;<br>• Method performance (validation) characteristics to investigate; and<br>• Suitable acceptance criteria. |
| *1500 to 1515* | *Refreshment break* |
| 1515 to 1630 | Comparison of data from transfer study:<br>• Non-statistical test approaches; and<br>• Comparative statistical tests which may be used e.g., two one-sided t-test (TOST).<br>Carrying out the experiments.<br>Preparation of the report.<br>Common problems encountered during method transfer and how to resolve them. |