

An Elective in Leeds and London



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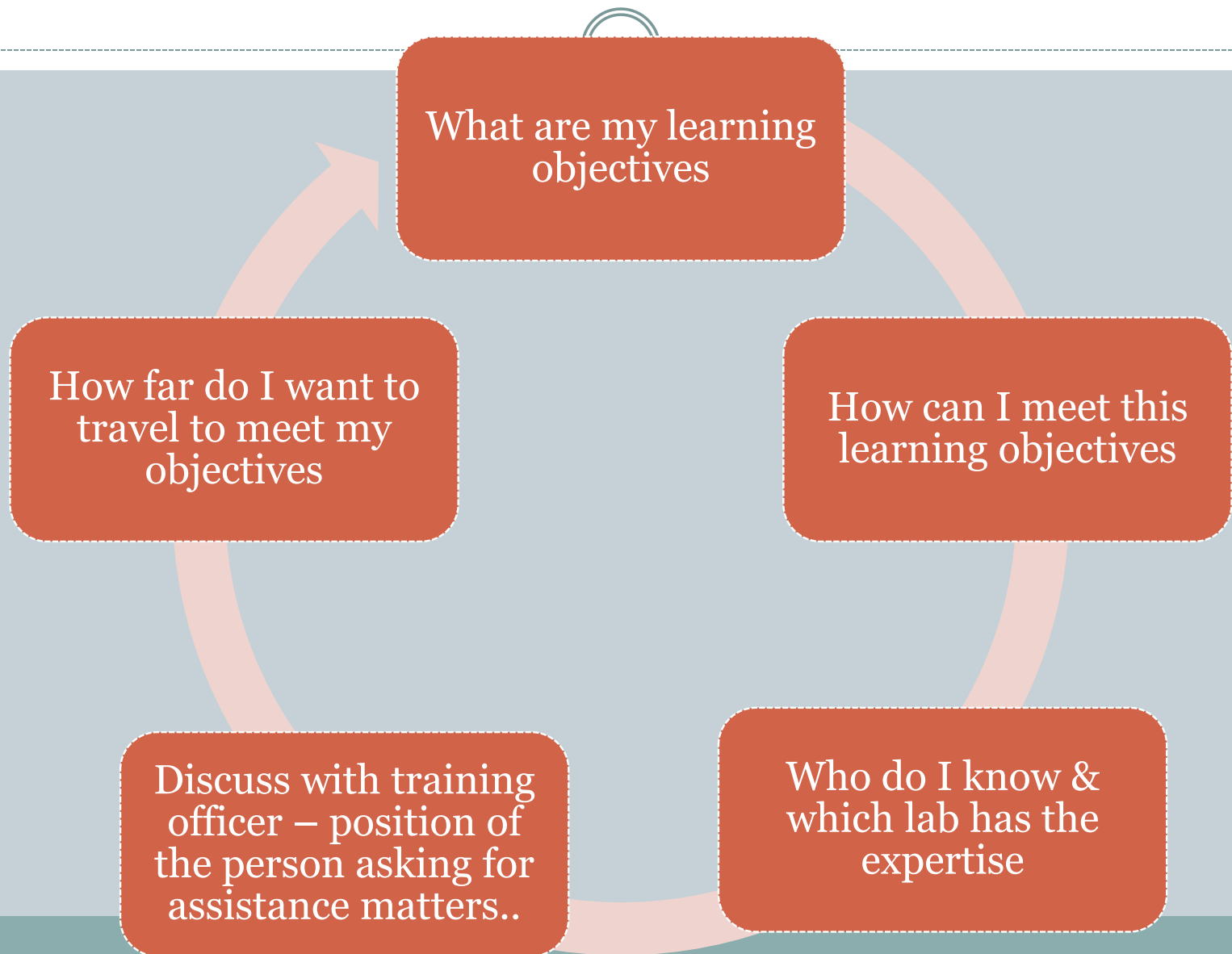
Torbay and South Devon
NHS Foundation Trust

Why I chose my elective



- I work in a district general hospital....
 - This has advantages and some short comings
 - Main analytical process involves routine biochemistry, immunoassay, protein electrophoresis and some TDM
- Specialist test requests are sent to other lab.
 - Big teaching hospital and regional specialist centres
- Wanted to gain experience of working in a teaching hospital lab and supra-regional specialist labs.
- Have hands-on experience of specialist laboratory instrumentation such as LC-MS/MS and GC-MS and understand their applications in various diagnostic tests, e.g. in endocrinology and steroid profiling.

Organising my elective



Organising my Electives

Leeds Teaching Hospital An SAS Lab



Introduction and training in:

- LC-MS/MS principles of operation
- GC/MS application in steroid profiling
- ICPMS in trace and toxic metal analysis
- Neonatal screening for hypothyroidism and cystic fibrosis

The Royal London Hospital Large teaching hospital



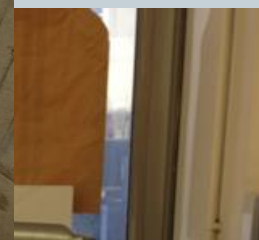
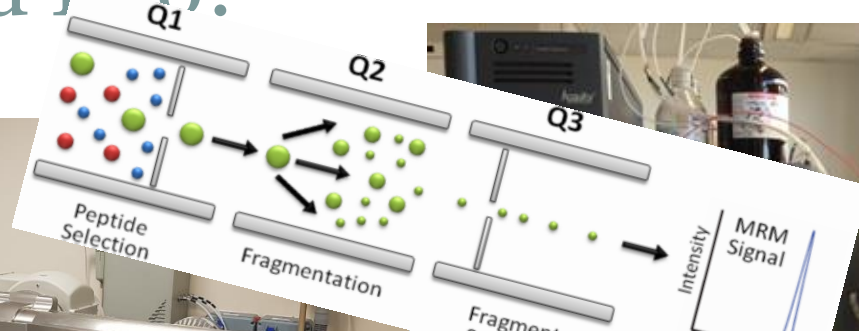
Consolidated training on LCMS applications

- Steroid analysis
- Immunosuppressants assay
- Drugs of abuse confirmation testing
- Vitamin-D assay

Learning objectives mapped to GSP

Learning Outcome	Mapped to GSP
1 Develop an understanding of the practical considerations in various sample prep methods applied and operation of LC-MS/MS and GC-MS	GSP 2.2.3 work within the principles and practice of instruments, equipment and methodology used in the relevant scope of practice
2 Learn new skill by collaborating with clinical scientists working in a laboratory setting different from that of a district general hospital.	GSP 3.1.4 demonstrate expertise in the wider clinical situation that applies to patients who present in your discipline.
3 Understand the rationale behind the clinical interpretive comment that accompanies specialist diagnostic tests.	GSP 3.1.12 provide interpretation of complex and/or specialist data in the context of clinical question posed.
4 Understand how GC-MS and LC-MS/MS data are generated and interpreted, potential sources of error and technical troubleshooting or analyser errors.	GSP 2.2.4 demonstrate practical skills in the essentials of measurement, data generation and analysis.
5 Understand the role of supra-regional assay service laboratories (SAS) in the provision of specialist biochemical tests for their region and wider NHS.	GSP 1.3.2 work effectively as a member of a multidisciplinary team.
6 Understand the procedure for the validation and verification of a liquid chromatography tandem mass spectrometry assay	GSP 2.2.5 assess and evaluate new technologies prior to their routine use

What did I do?



What did I gain/learn on my elective?



- various methods of sample prep used in LC-MS/MS & GC-MS and application in different assays
 - Protein precipitation, LLE, SPE
- Able to operate a range of the specialist instruments.
- Understanding of the process behind most of our send away test results and their interpretations.
- It is very manual oriented compared to fast-track chemistry
 - Potential for error due to sample mismatch
 - End-to-end positive patient and sample identification and record keeping is very important.
- **Meeting my learning objectives**
- Improved confidence in my understanding in various analytical processes.

What competencies did I complete?



- Completed x2 DOPs and x2 Toxicology competencies
 - Perform calibration and QC of an LC-MS/MS or GC-MS analysis used for TDM or toxicological testing.
 - Perform confirmatory testing for DOA samples
 - Perform an assay of an immunosuppressive drug.
- **CB-5-C-1** Perform the analyses to laboratory standard operating procedures for the following drugs: • digoxin and other cardioactive drugs • lithium • anticonvulsants • theophylline • **ciclosporin and other immunosuppressive drugs.**
- **CB-5-C-2** Perform the analyses to laboratory standard operating procedures for drugs of abuse testing, including: • screening protocols • confirmation tests.

Giving back to my host lab



- Undertook a mini project for the lab
 - ❖ Revalidation of whole blood sirolimus assay on LC-MS/MS to allow assay repatriation from send away lab and save cost.
 - Conducted different experiments
 - ✓ Drafted a validation plan and procedure
 - ✓ Precision study using commercial QC material
 - ✓ Testing bias by analysing past EQA samples
 - ✓ Between lab comparison by analysing aliquots of patients samples that had been sent to Harefield hospital.
 - ✓ Analysing data using ACB spreadsheet for the assessment of bias using patient samples
 - ✓ Write up of report of experimental data.
- Conducted a review of their immunosuppressants SOP and updated it in line with current practices to make it UKAS ISO 15189 compliant.



Thank you

Any Questions?